

JOURNAL

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A STATE PROGRAM OF AGRICULTURAL DEVELOPMENT¹

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Definite up-to-date study and comparison is needed of laws and practices affecting agriculture in different states and in different countries. Professor Stewart gave a brief review of a few of the problems involved before the American Country Life Association last summer, and presented a paper on another phase of the question last night. The talk by Dr. Taylor presents another phase of the subject. A number of the agricultural colleges are studying taxation and other public questions relative to agriculture. I have not made an exhaustive study for the different states, and the fifteen minutes which are available for this paper would make it impossible to attempt to give a general statement even if I were prepared to do so. I am merely giving a few of the developments which are taking place in the single State of New York—not because this is of more importance than other states, but because it is the one with which I am familiar, and because in this State very unusual progress in a policy of state development has been made recently.

I believe that agriculture and general welfare would be much better served if most of the effort were expended in getting fundamental legislation, that is, legislation that

¹Address at luncheon session of twentieth annual meeting of the American Farm Economic Association at Washington, D.C., December, 1929.

would be needed if there were no depression rather than in efforts to get emergency legislation. Legislation is generally too slow to meet emergencies. But when emergencies arise, it is a good time to put basic needed legislation on the books.

New York State has had a very fortunate combination of circumstances. During recent years it has had the benefit of studies by a number of commissions such as the Commission on Taxation and Retrenchment, the Industrial Survey Commission, the Committee of Twenty-one on rural schools, the Reforestation Commission, which still continues, and a number of others. The research work of the College of Agriculture has also been of value in finding basic facts. The farm organizations such as the Grange, Horticultural Society, Farm Bureau, and Home Bureau have worked with the large business cooperatives, the G.L.F., and the Dairymen's League, so that farm problems are thoroughly discussed, and when a conclusion is reached, it represents agriculture. Formerly, there were not sufficient facilities for discussion, nor for expression. Anyone who was born on a farm was assumed to speak for agriculture. This is no longer the case.

It is fortunate that at this particular time, the State has a Governor who is interested in, and has a knowledge of, both urban and farm affairs, and at the same time it has a legislature that is interested in State development.

Before he took office, the Governor appointed an advisory commission on agriculture. The chairman of this is a publisher of a farm paper. Its membership includes representatives of farm organizations, Master Farmers, members of the legislature, heads of some of the State departments, representatives of the Colleges of Agriculture, and Home Economics. Practically all of its many recommendations have been endorsed by the Governor and enacted into law.

Some of the more important problems about which legislation is needed at this time are: schools, roads, electric power, health, and land utilization.

Roads were formerly considered to be local. In New York State as in other states, either the farmer or the local community first had entire responsibility for the roads. Private toll roads were not uncommon. When the need for stone

roads came, the old ideas prevailed in all states. In some states as in Ohio, the first stone roads were largely charged to the farmers in the area, as street paving is often charged in cities. Even farmers a mile away were compelled to pay for a stone road which they could not see and could never get to with a large load except when dirt roads were good.

There has been a gradual development of the idea that roads are not purely local, but the wider use has always been in advance of knowledge concerning roads.

Studies made by the College of Agriculture helped in showing the use made of roads and the support of them. On the hard-surfaced roads in New York State, vehicles from other states use the roads nearly twice as much as vehicles from the township, plus all horse travel combined. Of the travel originating within the State, more than half comes from other counties than the county in which the road is located.

A good example of the failure to appreciate the wider use of roads was given a few years ago by a popular vote in New York State. The Constitution was amended so that 25 per cent of the cost of eliminating grade crossings should be paid locally, 25 per cent by the State and 50 per cent by the railroad. In some cases, less than one-tenth of one per cent of the travel at these crossings was from the township in which the grade crossing was located. The cost of eliminating the crossings in poor townships would bankrupt the townships. This law proved so bad that a new amendment to the Constitution was passed, leaving the apportionment to the legislature. Ten per cent was then assigned to the county. Last winter this was reduced to one per cent. (The remaining portion of this paper is revised to include legislation passed since the paper was presented.)

The State highways are the main roads. They constitute nearly one-sixth of all of the miles of road in the State. Before last year, the counties had to pay 35 per cent of the cost of bridges and of the construction and reconstruction of State highways. Legislation passed last winter provided that the entire cost of construction and reconstruction be borne by the State.

Before last year, townships were required to pay the

State \$50 per mile for the maintenance of State highways. The State has now assumed this obligation.

Formerly the towns and counties did all the work of snow removal on State highways. The State now pays half of this cost.

The right-of-way for State highways is still paid for by the counties. These costs are high in rich counties and low in poor counties so this item of expense tends to equalize itself.

A two-cent gasoline tax was passed. Five per cent of the money is given to New York City. Twenty per cent is given to the counties on the basis of miles of highway outside the State system. The State keeps the balance.

Former legislation provides that 25 per cent of the registration fees be returned to the counties on the basis of car registration. This sends the money back not to where the roads are nor where the cars are used, but where the garage is located. Many of the chain stores, oil companies, and many other corporations register all their vehicles in one city. Many of these vehicles never enter the county where registered. Of course, nearly all city owners of cars use them to travel outside the county where they reside. Probably the combination of sending a part of the money back to where the garage is and a part to where the roads are, averages the distribution somewhere near equitably. One favors the rich places and one favors the poor places. The sound point of view is to consider the roads as a problem of State development. Roads are not a local question.

The California plan of tax collection by a nominal registration fee and with practically all the tax on gasoline, is, of course, a better plan than collecting as much on registration fees as is done in New York, because the tax should be on use rather than ownership of a car. The other problem is what to do with the money after it is collected. For good State development, a considerable portion of the money should go where the roads are, rather than where the residences are. The recent legislation in New York, although not perfect, is a great improvement over the past.

One of the earliest pieces of road legislation bearing on State support for roads was passed in 1898. It provided that the State should pay to each township a sum based on

the amount raised by the township and the assessed value per mile. It limited the State aid to \$25 per mile unless the township had an assessed valuation of property outside of incorporated places averaging more than \$25,000 per mile. If more than this, the aid was one-tenth of one per cent of the assessed value. With the great growth of values in many regions, the State aid grew rapidly until in some townships, it reached \$1,500 per mile. This legislation seems to be based on the idea that "to him that hath shall be given." This law was amended to apply to the roads outside of the State and county systems and with two principles in mind. "What maintenance is necessary?" "What is a reasonable tax?" For road support, \$100 per mile was accepted as a basis. A three-mill tax was set as a reasonable tax. If the township raises a three-mill tax on the full value of the property, the State will pay the balance of \$100 per mile. Note that this is full value and not assessed value. The State has for years had a successful board of tax equalization, or this could not be operated. Some of this money will be used to build stone roads. This legislation is primarily a re-distribution of money on a different basis. It prevents the State budget from growing indefinitely at the same time that it applies a more logical method of State aid. Naturally, it was opposed by some of the townships which would lose.

The above principles were applied to school legislation. "What is necessary to maintain a satisfactory school?" "What is a reasonable local tax?" Legislation on school support had been progressing by patch-work method for many years. Last year, a law was passed providing that if a locality will raise a tax equal to 4 mills on the equalized value of the property in the school district, the State will pay the balance of the cost up to \$1,300 for a one-teacher school this year, \$1,400 next year, and \$1,500 per year thereafter. This provides equalization on a State basis. It is more than the amount now spent so that this provides better schools and helps poor districts. If a district desires a still better school, it may raise more than 4 mills. Similar legislation applies to schools with more teachers.

The land in New York is extremely variable as it is in most glacial regions. Much of it is extremely valuable for

farming, but some is much better adapted to forests than to other farm crops. At the time the State was settled, the land was settled with almost no discrimination.

There is considerable idle land in New York that has been farmed, and much land that is being farmed that is better adapted to forestry than it is to other crops. Definite State action is necessary if this situation is to be corrected. It will never correct itself completely, and will only very slowly correct itself at all.

The State now has a Commission on Reforestation. Most of the members of this are members of the legislature. Some were appointed by a previous governor and some are chosen by the Commission. This is a very satisfactory way to form a Commission. This Commission recommended three steps, two of which are now laws.

The State will give any county up to \$5,000 per year provided the county raises an equal sum for the purchase of land, reforestation, and care of forests. The State also furnishes free the trees for planting.

The State has a number of nurseries, but must develop more to meet the new program. An appropriation of \$120,000 was made last year for the establishment of nurseries and the purchase and reforestation of land. A similar appropriation of \$400,000 was made this year, and \$600,000 is recommended for next year. The Commission recommends a constitutional amendment ordering increasing appropriations for eleven years, to make a total of \$20,000,000 with the intent of purchasing and reforesting about 1,000,000 acres. Such a program requires increasing appropriations and a continuity of policy so that an increasing number of trees may be grown as the land is acquired. It cannot proceed without a plan for some years ahead, hence the necessity for popular vote on it. This proposed amendment has passed one legislature. It must be passed by another and then be voted on by the people. The State is becoming forest-minded and it seems probable that this legislation will pass.²

The State has been acquiring forest lands for some years and now owns over one-twelfth of the area of the State, but most of this is in the mountains.

² Preliminary Report of the Reforestation Commission, Legislative Document No. 63, Feb. 6, 1930.

At the Governor's request, the Mayors' Conference appointed a Committee on regional markets. This Committee has reported but as yet no action has been taken.

The Governor's Advisory Commission on Agriculture has had two meetings to consider rural electrification. This undoubtedly hastened the extension to most parts of the State of rates for rural lines that were already in effect in some areas. Also provision has been made for persons to be employed by the Public Service Commission to give attention to rural electrification.

In line with modern business, the State recognizes that research is essential, and provision has been made for the beginning of a survey of the agricultural resources of the State; for a study of rural government, just as farm management has been studied; and for more work in cooperative marketing as well as for increased research work on biological questions.

Some badly needed buildings for research work are also provided for horticultural research, for home economics, and a building for agricultural economics.

These are a few of a very large number of laws affecting farmers.

For the more densely-settled States, I believe that we should look forward to a time in the near future when substantially all of the farmers will be located on hard-surfaced roads, with hospitals and high schools available, and with adequate police protection. By the use of fertilizers, lime, tile drains, disease control, it is cheaper to produce the State's food supply on the best land than to attempt to farm all of the land. It is not worth while to extend the necessary improvements to poor land. The poor land had best be used for forestry. It will then provide for the regulation of stream flow, protection of water supplies, improve the looks of the State, and provide for hunting, fishing, and recreation, at the same time that the trees grow. I have no doubt but that we will need the lumber, but if we should not, the other advantages of forests in a densely-settled region are sufficient to justify all the cost.

How is such a program financed? The gasoline tax and the registration fees pay all the State's road costs and the State aid for localities in road building. On this score, the

State is better off than it was before the passage of the gasoline tax. The school legislation is the chief item that calls for increased outlay. For purposes other than roads, the State derives most of its income from personal income, inheritance and corporation taxes. The State tax on real estate has been small and was dropped last year. This leaves this source of revenue to the localities. The most important point in this program is the point of view on State development and the principles involved in bringing it about.

No such progress can be made without the cooperation of many agencies. The Governor is, of course, the pivotal point in it. If one were talking at a meeting of governors, he would naturally emphasize the State policies involved and the machinery for accomplishing the results. If he were talking to legislators, he would naturally emphasize the methods of legislative procedure to study the facts, arrive at decisions, and pass the necessary laws. The work of the Reforestation Commission would well illustrate this. If one were speaking to farmers' organizations, he would naturally emphasize the ways of procedure to get farm problems intelligently discussed and the ways in which the decisions are presented. If talking to a Chamber of Commerce, he would naturally emphasize the value to all industry of a progressive policy of State development. Since I am talking to agricultural economists, I naturally over-emphasize their part in the work. I should perhaps express my opinion of the place of these workers in State planning. I believe that their primary function is as reliable fact-finders. When a commission or other State agency is considering any problem affecting rural development, it should be able to turn to the Agricultural Colleges for basic data that will be accepted by all parties as scientific and accurate.

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ORGANIZATION OF FARM MANAGEMENT AND OUTLOOK INFORMATION FOR EFFECTIVE EXTENSION USE

HENRY KELLER, JR.

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The ultimate aim of every worker in the field of agricultural economics is to improve the economic situation of the farmer. Every economic research problem is aimed directly or indirectly toward this goal. The results of these research problems are presented to the farmers through the agencies of the many state agricultural extension services. The purpose of this paper is to explain how the New Jersey Agricultural Extension Service made more effective the presentation of farm management and outlook information.

Two reasons predominate why farm management extension and outlook information have not been so effective as one might wish. First, farm management information has not been presented in such form that extension workers and farmers can put it to use: too often the analysis is so technical that the farmer or extension worker finds it beyond his comprehension, or even though the extension worker understands the information, he cannot interpret it so that the farmer understands it. Second, extension workers and farmers have not been shown how to relate farm management information and outlook information. The effectiveness of either is, of course, greatly impaired when presented and analyzed independently of the other.

One should not infer from these statements that farm management research must be so simplified that laymen in general may readily understand it. Since research methods are justified by their results, if analysis involving difficult technique is necessary for obtaining certain relationships, then that form of analysis must be used. But research methods and extension presentation are two different things, the one attempting to define and measure trends and relationships, the other attempting to explain how these meas-

ures and relationships may benefit the individual farmer or group of farmers. The first may be very technical; the latter, if it is to be effective, must be presented in such a way that misunderstanding, or, lack of understanding, is avoided. When anyone attempts to present the results of an especially intricate research problem to a group of farmers, if he does not have in mind these differences between research and extension presentation, it is quite likely that he will fail. No attempt will be made here to discuss or criticise research methods. Effective extension presentation will be the only problem discussed.

The Extension Division of the New Jersey Agricultural Experiment Station, anxious to improve the work dealing with the presentation of farm management and outlook information, asked the Federal Bureau of Agricultural Economics and the Department of Agricultural Economics of the State Agricultural Experiment Station to cooperate in planning an extension conference that would present farm management and outlook information more effectively to the extension workers. Two research projects were selected; one, a study of comparative advantage in the intensive potato area of New Jersey, and the other a study of New Jersey poultry production. The results of these investigations were to be presented in such a manner that the extension workers could use them more advantageously in their routine programs. The method used in presenting the results of the potato investigation only will be discussed.

Any study of comparative advantage is concerned with ratios between productive systems within areas, and ratios between competing areas. The procedure involves input-output comparisons that are not simple or easy to handle. Obviously, the results of such research, if they are to be used effectively for extension presentation, must be so stated that they are readily understood by farmers.

Inasmuch as the time allowed for preparation of material was limited, it was decided to present budget comparisons of the different types of farming common to the area. Budget analysis, in itself, is far short of being an analysis of comparative advantage, but a relationship does exist, however, between budget comparisons and that part of the com-

parative advantage analysis that deals with those ratios between productive systems within the area. A complete explanation of this relationship is not attempted here.

The method of budget comparisons requires first, the determination of farm types, and second, the determination of the expenditures and receipts of each farm type. Two main farming systems were selected for the potato area. One, known as the regular rotation, consisted of potatoes, hay, rye and corn; the other of potatoes, hay and truck crops. Each system was divided into types determined by the position potatoes had in the set-up: whether they predominated or were subordinated to the other crops in the rotation. In all, seven types were selected and the detailed analysis on each of the seven types was developed in the same manner.

Outlay budgets for each type of farm were developed as follows: expenditures for each farming type were determined, only those items that involved the outlay of money being included. Consequently neither operators' labor nor family labor were included. Physical inputs per acre for each crop were ascertained from the cost-studies used in the research problem and the money outlay was determined by multiplying each physical input by its price. Inputs of labor, seed, fertilizer, and the other cost factors were all determined in this manner. The total money outlay for each farm type, that is, the summation of all the inputs that were necessary to carry on that type of farming, represented the expense side of the budget for that particular farm set-up.

Average yields per acre, taken from the survey records of the area, were assigned to each crop, and after farm requirements had been deducted, the remainder represented the quantity of the crop to be sold. By multiplying the amounts to be sold by the farm prices of each of the five years from 1924 to 1928, there was derived the gross returns representing, for five different price conditions, the expectations of the average farmer, on the average farm, under average circumstances. By deducting the amount of out of pocket expenses from each of these gross returns there was derived the net farm income to be expected from

each type of farm under the five specified price conditions.

Tables for crop outlay, general outlay, crop utilization, farm receipts and farm income were constructed for each type of farm. Weekly labor distribution for each crop, which included both man and horse labor, was likewise tabulated. These tables were mimeographed and put together in a form that made them readily available for reference.

The extension staff, consisting of county agents, club agents and production specialists, was called together and the material was presented to them. Each person was given a copy of the mimeographed sheets. First, the outlook information was summarized from the charts published by the United States Department of Agriculture, which were supplemented by special charts on production, prices and yields per acre of the area involved, prepared for this occasion. Then the material in the mimeographed sheets was presented, each step in the analysis being carefully explained. Comparisons of expenditures, sales, and net incomes between the different types of farms were made. The relationships between the findings here and the recommendations indicated by the outlook information were emphasized.

Following the presentation of the data comparing the various types of farm set-ups, each member of the extension staff was given a problem to solve. With the mimeographed outlines containing tabulations of all the facts concerning expenditures and receipts, data as to labor expended on production, and other expenses, the work involved in each problem was merely the fitting of the necessary information to each individual case. Each problem was designed to emphasize to the extension worker the value of the analysis just explained to him and the way in which it could be applied to his particular problems. When these exercises were completed they were assembled and graded. Several of the solutions were read and critical comments were made on the various methods of approach. A summary of the entire conference discussion was given and the conference adjourned.

The extension workers were given the idea of comparisons that can be made on the individual farm. They must

substitute for the average unit inputs, expenditures, and yields, the farmer's actual results, if the most advantageous set-up of the farm is to be determined. The extension workers were given a basis for supplementing and verifying outlook information by enabling them to utilize this synthetic type of farm set-up, and by comparing the results obtained with that of the outlook information. But beyond all that, the extension workers were given a basis for an analysis that any farmer can understand and use.

Only one phase of the potato study was used for this extension demonstration. As each portion of the study is completed, it is planned to prepare it also for extension demonstration. The problem of comparing ratios of competing areas and the problem of determining the highest-profit combination will be analyzed; in fact, every portion of the study will actually come to the extension worker phrased in such a manner that he can bring to the farmer a practical interpretation of the economic principles developed. It is only when such an analysis is accomplished that we can feel that we have been really effective in presenting our extension material.

THE ORGANIZATION OF FARM MANAGEMENT AND OUTLOOK INFORMATION FOR EFFEC- TIVE EXTENSION USE

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Let us picture ourselves in a county agent's office located in a county where commercial poultry flocks are fairly numerous. A farmer, experienced or inexperienced in the poultry business, enters the agent's office and raises the following question. "I started the poultry year last November 1 with 500 hens and 1,000 pullets. How much farm income will I most probably make between now and October 31, 1930? I shall use eggs from my own hens for hatching. I will not sell any baby chicks this coming spring. In fact, my only income will be from market eggs, broilers, and meat. I do not intend to sell any hatching eggs, cockerels, or hens for breeding purposes or broilers other than those which I will have as part of the replacements that I raise."

After stating this problem the county agent usually replies first, "Well, Mr. Blank, it all depends upon the individual, his managing ability, type of houses, quality of birds, disease in flock, price of eggs, price of feed, supply and demand, and luck."

I have heard the above and other economic and management questions answered in about this way. I am sure that the conscientious county agent is not satisfied with such an answer and I know that the farmer is not satisfied.

Some of our county agents may go further and pull out a copy of an economics poultry management club report and show the farmer that last year the *profit* above feed cost in his county was \$3.00 per bird. Some may go still further and get a report of an egg laying contest and show the farmer that if his birds will produce say 182 eggs a year his *profit* above feed cost should be so much per bird.

The county agent may take one more step and refer to a farm management survey on commercial poultry farms taken last year, or four or five years ago, and find the aver-

age income over feed or farm income or labor income on these farms. In attempting to answer the question rather specifically as to what farm income the commercial poultry farmer with 500 hens and 1,000 pullets on November 1 might expect to make this coming year, the county agent so far has not given a very definite or specific answer. He may have at hand some wholesale price data on eggs and he may attempt to check up on the cold storage holdings in the four major markets, or current receipts and he may bring out the latest Outlook report for the country as a whole or for the state of New Jersey. It is my feeling that the information which the agent needs to answer the question has not been analyzed, correlated and standardized so that the county agent of even more than average ability could answer this question or even arrive at a very fair answer. In other words, under present methods of analyzing standards and price data the county agent is unable to answer the question asked.

It is recognized by all of us that county agents in most of the counties of a state like New Jersey must have a general fund of knowledge on many and diverse subjects. I need not take time to illustrate this point which I think self evident to any one who knows the diversity of our type of agriculture. In view of the fact, that the county agent must be able to render service on many and diverse subjects, it becomes necessary for the extension specialist to standardize the work in his particular field so that the county agent can not only soon master the information which he is to use and extend but so also that he can do it without much effort on his part in order that it will be clear, definite and specific for farmers who are to use the information. I believe that the county agent should have some knowledge of every survey taken in his county, should assist in the analysis of the data and in other respects be brought into the picture.

In our technical departments it has become a practice to standardize as near as possible the recommendations for certain practices. For example, on white potatoes in our Central Jersey potato area the standard fertilizer application recommended is 2,000 pounds of a 5-8-7 analysis. There

are variations in the use of this standard by farmers, but in general the county agent has no hesitancy in making this standard recommendation. Again we have certain feeding standards for poultry and dairy cows. There are variations in these standards but our county agents recommend them without much equivocation.

It seems to me that in order to make our extension work in Agricultural Economics more effective and more useful to county agents we shall need to look forward to this important matter of setting up economic standards. I realize, of course, that the nature of economic standards is quite different from that of fertilizer or feeding standards. However, because the field of economics is one in which it is more difficult to set up standards, there is no reason for our shying away from the task.

The importance of analyzing our economic information so that it will be of a more specific and definite help to our county agents and farmers has been somewhat of an obsession with me for many years. I have felt the need of better analysis and interpretation of many of our studies in farm management and marketing, and of the importance of tying this up with our outlook information. I have contended that the compilation of a few farm management survey figures, the retabulation of figures from the Agricultural Yearbooks, from the census and other sources without proper interpretation and analysis of the meaning of these figures is neither statistics nor economics. Certainly those of us who have been dealing with county agents for a great many years and with farmers realize that both want a better interpretation and analysis of economic and statistical information, so that applications can be made on the farm. At present with much of our work, county agents and farmers say—"Well that is very interesting. You certainly did a lot of work to collect all those figures but I fail to see the practical application."

To answer the question raised at the beginning of this paper, therefore, requires considerable thought and work on the part of someone. I believe that it is the Extension Economists' job to do the thinking and the extension analysis so that an answer can be given. He knows what the

farmer is thinking about and what kind of information he is asking for. It is his job to interpret the information to county agents also. To say that it cannot be interpreted definitely and specifically would in my judgment condemn the extension economist. If we can not as Extension agents, standardize our work and be more specific in our interpretation of economic and statistical facts so that farmers can take our analysis and make certain adjustments on their farms then what good are we? And, furthermore, what good is all the research work in Agricultural Economics?

In New Jersey an effort is being made to answer economic questions like the one which was quoted above a little more specifically. Since 1913 we have had research data on commercial poultry flocks. We have a great accumulation of data from poultry farm management surveys. We also have the data for years covering the poultry economic management clubs conducted by our Extension Service. We have a great mass of data on egg prices, receipts of eggs and cold storage holdings. We also have the National and State Outlook Reports. These data, however, have never been systematized or brought together so that anybody in any department could intelligently arrive at a fair answer to the question of what income might be expected from a flock of birds of different sizes.

In the last analysis every poultry farmer is confronted with economic questions such as the one which is raised, and regardless of our hesitancy or shyness he must answer the questions. If he is to succeed he must adjust his operations according to the economic and technical information at hand. Can we as leaders, simply answer in an indefinite way?

Our poultry department has performance records of White Leghorn birds by months for the past 16 years. Our Extension Service has the performance records of White Leghorns in commercial flocks by months on several hundred farms for the past 7 years. Our farm management surveys cover the performance and production records by years, capital invested, size of flocks, size of farms, receipts and expenses, farm and labor incomes. Our research work has enabled us to collect a mass of data on egg prices

of different grades, feed prices, cold storage holdings, receipts, exports and imports; and we have the National and State outlook reports.

The problem therefore, as I see it is to bring together all the work on performance, management and prices that has been done in our poultry department, farm management department and in our extension service and tie that up with the National and State outlook information. After the research work is tied up with prices of poultry products for sale, and poultry expenses and the National and State outlook reports, then the next step is to get the standards, the price information and the methods to county agents so that they can teach it to farmers. We must lay out these standards and explain our methods rather carefully to county agents. We attempted to do this last September at an annual conference of extension workers in New Jersey.

Specifically this is what we did. First, we rounded up all our data on performance and our farm management survey data on commercial poultry farms and tied this up with prices of eggs and prices of feed, using different alternative prices for both eggs and feed. We outlined four systems of poultry farming rather common in New Jersey outside of the metropolitan area. We took this analysis to a group of eleven rather successful poultry farmers and got suggestions and criticisms from them. We then presented this to our county agents at a conference and held a three hour laboratory exercise where each agent was given a specific problem to work out.

I believe that county agents in New Jersey can fairly definitely answer the question raised at the beginning of this paper now. The margin of error may be large until we get more regional or area data on prices and standards, but certainly we should hope for a more definite answer than most county agents are able to give. Certainly county agents should be able to take a step further and be able to approach a more satisfactory answer than by saying to the farmer, "It all depends upon the individual", or, "Here is bulletin 456 on a survey of 236 poultry farms, the latest cold storage holdings, prices of nearby fresh eggs for 28 years, the latest government report on current receipts at the four major

markets, and the latest outlook reports—take these home, and read them, Mr. Blank.”

What the county agent needs is more local standards of performance, more local price data on eggs, more local cost data on feeds and other expenses. Then these data should all be tied into outlook information, and presented in such a simple way that the farmer can see the direct application of these economic principles, to his own poultry business.

In conclusion I would suggest (1) that we attempt to set up our standards in economics for our extension agents and farmers. (2) That proper, simple and careful interpretation be given to all research work in our field so that our extension agents can teach it and so that farmers can make more definite and specific use of the information on their own farms. (3) That some laboratory training at the time of extension conferences or in short courses lasting a week or so be given our county agents so that they can better interpret our economic extension data, and principles.

Table I shows the number of hens and the number of pullets that a man of average ability may expect to have on hand each month. The number of deaths and culls are also shown for each month.

Table II is the record of performance table. This indicates the number of eggs that both hens and pullets are likely to lay each month of the year provided they are managed under average management conditions. This table also gives the total number of dozen of eggs for sale, assuming that all eggs laid are for sale except those used in February and March for hatching. We have no reliable data on the percentage of eggs that are cracked or otherwise unsalable, in our commercial poultry flocks. This table furthermore, gives an idea of the most probable income that a man of average ability may expect to get for market eggs each month when the price for his eggs is based on the average price for 1927-1928.

Table III also gives some standards, particularly the important standards relative to pounds of all kinds of feed consumed by both hens and pullets each month. Feed cost

per bird is based upon average prices for feed for 1927-1928. The feed cost of the flock by months and for the year and the difference between the egg income and the feed cost of the flock are also shown.

Table IV shows first the capital that is required for engaging in the poultry business in New Jersey outside the metropolitan area. Capital invested in dwellings for systems II, III, and IV may seem a little high. However, these dwellings were equipped with electricity, steam or hot water heat, electric water pumps, running water in kitchen, bathroom, and indoor toilet. The capital invested in land is at the rate of \$200.00 per acre, but this capital covers fences for poultry runs and yards. Capital for machinery and equipment covers brooder stoves, buckets, feed hoppers and tools, but not the family automobile. Capital for feed and supplies covers all kinds of feed, egg cases and disinfectants—enough for about 1 week to 10 days.

Table V shows the receipts and expenses which are most probable under the four systems when prices for eggs and feed are the average 1927-1928. This table shows the farm income and the farm income per bird under each system.

Table VI is distinctly based upon both research and extension information gathered on farms and agricultural outlook information. This table is the one which really answers the question asked by the farmer when he appeared at the county agent's office and asked "How much farm income will I probably make with 500 hens and 1,000 pullets between now and October 31, 1930?". This can be found under system three in table VI.

Under system III of Table VI the county agent can point out to the poultry farmer that with varying prices for feed and eggs the man with average ability and with a flock of 500 hens and 1,000 pullets at the beginning of the poultry year has a chance to make a farm income from around \$2,008 to \$3,865. In years when the outlook is least favorable, the income is likely to be around \$2,008. In years when the outlook is most favorable, the income is likely to be around \$3,865. In years when the outlook is only fair the income is likely to be about \$2,459.

TABLE I—NUMBER OF HENS AND PULLETS ON HAND AND AVERAGE MONTHLY AND YEARLY DEATHS AND CULLS FOR A FLOCK OF 500 HENS AND 1000 PULLETS

	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Average or Total
Number of Hens.....	500	485	478	468	452	437	418	395	362	316	257	201	397
Number of Pullets.....	1000	984	965	938	907	871	834	777	702	606	513	445	795
Total.....	1500	1469	1443	1406	1359	1308	1252	1172	1064	922	770	646	1192
Number Deaths.....	8	6	11	16	16	19	24	22	21	16	6	7	172
Number Culls.....	23	20	26	31	35	37	56	86	121	136	118	139	828

TABLE II—EGGS LAID PER HEN AND PULLET, DOZENS OF EGGS FOR SALE AND MOST PROBABLE EGG INCOME IN 1930 FROM A FLOCK OF 500 HENS AND 1000 PULLETS

	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Average or Total
Hens Laid per Hen.....	1.7	2.1	5.6	9.7	15.6	16.8	17.3	15.7	15.4	14.0	10.6	5.7	130.2
Eggs Laid per Pullet.....	7.5	11.1	13.4	13.6	16.5	16.6	17.3	15.7	15.4	14.3	11.3	6.8	159.6
Total Doz. Eggs.....	695.8	995.1	1300.7	1241.4	1634.8	1816.7	1804.9	1533.4	1365.5	1090.9	710.1	347.7	14536.9
For Sale.....													
Most probable Income based on Average 1927-1928 price.....	\$448	\$590	\$674	\$538	\$628	\$672	\$655	\$583	\$580	\$542	\$431	\$256	\$6597

* It is assumed that all eggs laid are for sale except 200 dozen in February and 200 dozen in March which are deducted for hatching.

TABLE III—MOST PROBABLE FEED COST AND DIFFERENCE BETWEEN EGG INCOME AND FEED EXPENSE IN 1930 FROM A FLOCK OF 500 HENS AND 1000 PULLETS

	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Average or Total
Pounds of Feed Per Bird.....	6.7	7.1	7.6	7.2	7.9	7.6	7.5	7.1	6.9	7.2	6.9	6.5	86.6
Feed Cost Per Bird (1927-28).....	17.5c	18.4c	19.8c	19.5c	21.3c	20.7c	20.4c	19.8c	20.6c	20.0c	18.9c	18.6c	\$2.35
Feed Cost of Flock (1927-28).....	\$263	\$270	\$286	\$274	\$289	\$271	\$255	\$232	\$219	\$184	\$146	\$120	\$2810
Difference between Egg Income and Feed Cost of Flock (1927-28).....	\$186	\$320	\$388	\$263	\$338	\$410	\$400	\$351	\$361	\$358	\$286	\$136	\$3787

TABLE IV—CAPITAL REQUIRED FOR DIFFERENT SIZED COMMERCIAL POULTRY FLOCKS IN NEW JERSEY

	System I (500)	System II (1000)	System III (1500)	System IV (2100)
Capital:				
Dwelling	\$3,200	\$ 5,900	\$ 8,400	\$ 8,300
Other Bldg's	1,800	3,200	4,300	5,600
Land	1,000	2,000	3,000	5,000
Real Estate (total) ...	6,000	11,100	15,700	18,900
Poultry	1,000	2,000	3,000	4,200
Mach. & Equip.	100	170	250	300
Feed & Supplies	50	100	150	200
Total	\$7,150	\$13,370	\$19,100	\$23,600

TABLE V—RECEIPTS AND EXPENSES FOR DIFFERENT SYSTEMS OF POULTRY FARMING IN NEW JERSEY WHEN EGGS ARE USED FOR HATCHING (AVERAGE PRICES FOR RECENT YEARS 1927-1928)¹

	System I (500)	System II (1000)	System III (1500)	System IV (2100)
Receipts:				
Market Eggs	\$2,197	\$4,431	\$6,597	\$ 9,226
Broilers ²	200	420	600	840
Meat	233	485	696	974
Total	\$2,630	\$5,336	\$7,893	\$11,040
Expenses:				
Baby Chicks ....	...	...	...	...
Hatching ³	\$ 50	\$ 104	\$ 144	\$ 209
Egg Cases ⁴	32	65	97	136
Labor .....	...	50	75	300
Feed-Pullets ⁵ ...	241	504	720	1,008
Feed-Broilers ⁶ ...	120	252	360	504
Feed-Layers	936	1,874	2,810	3,933
Others ⁷	280	465	593	710
Repairs & Dep. ⁸ .	250	455	635	695
Total	\$1,909	\$3,769	\$5,434	\$ 7,495
Farm Income Not Including Inventory .	721	1,567	2,459	3,545
Per Bird	1.44	1.57	1.64	1.69

¹ Prices for eggs and feed are average (1927-1928).² Broiler sales at 50 cents each.³ Hatching at 3 cents an egg.⁴ Egg cases at 20 cents each.⁵ Feed cost for raising a pullet to Nov. 1—72 cents.⁶ Feed cost for producing a broiler to 10 weeks—30 cents.⁷ Table below.

OTHERS—(EXPENSES)

	System I (500)	System II (1000)	System III (1500)	System IV (2100)
Coal	\$ 40	\$ 80	\$ 95	\$130
Taxes	90	110	175	200
Insurance	20	35	50	60
Electricity	50	100	120	130
Plowing	25	50	50	60
Sprays	10	20	25	30
Fuel & Oil	30	48	48	55
Incidentals	15	22	30	45
Total	\$280	\$465	\$593	\$710

Coal at 4 cents per chick.

Taxes estimated.

Insurance \$3.00 plus per thousand.

Other items estimated on basis of System II which is somewhat similar to average 3 farms in survey.

⁸ Figured at 5 per cent on value of all buildings. Some commercial poultrymen may disapprove of figuring depreciation on the dwelling. But it has been done in the above systems.

TABLE VI.—FARM INCOME TO BE EXPECTED IN NEW JERSEY FROM DIFFERENT SIZE POULTRY FLOCKS WITH VARYING PRICES FOR EGGS AND FEED AND WHEN EGGS ARE USED FOR HATCHING

Prices Of Eggs												
Cost of Feed Per Bird	Highest Price for Eggs (1923) 56.4 cents				Avg. Expected Price for Eggs (1927-1928) 49.5 cents				Lowest Price for Eggs (1928) 46.3 cents			
	Sys- tem I 500	Sys- tem II 1000	Sys- tem III 1500	Sys- tem IV 2100	Sys- tem I 500	Sys- tem II 1000	Sys- tem III 1500	Sys- tem IV 2100	Sys- tem I 500	Sys- tem II 1000	Sys- tem III 1500	Sys- tem IV 2100
Lowest Feed Cost 1924—\$2.13	\$1189	\$2514	\$3865	\$5511	\$315	\$1756	\$2742	\$3941	\$685	\$1492	\$2351	\$3395
Average Expected Feed Cost 1927-1928—\$2.35	1095	2325	3582	5115	721	1567	2459	3545	591	1303	2068	2999
Highest Feed Cost 1928—\$2.40	1075	2285	3522	5039	701	1527	2399	3460	571	1263	2003	2914

DISCUSSION BY A. E. ANDERSON

SOUTH DAKOTA STATE COLLEGE

Two limitations on effectiveness of our farm management information as related to Extension work have been mentioned in the beginning of Professor Keller's paper. First, "that farm management information has not been presented in such form that Extension workers and farmers can put it to use." Obviously if we can not ultimately secure the application of sound and fundamental farm management information in a practical way by farmers themselves to improve their economic situation, then our work both research and teaching has been largely lost. The problem before us is to remove as far as possible the limitation to successful application of this material. The subject of this discussion assumes the use of the organized material by an Extension staff and eventually by the farmer. We interpret also that it is not just the farm management Extension specialist alone who is to use this material in an effective Extension way. We have but one Farm Management specialist in a state with sixty-nine counties. The volume of farmers' application of this information is dependent upon contacts with a large force of Extension workers using effective methods such as has been illustrated and demonstrated by Mr. Keller and Mr. Knowles. We believe every county agent as well as the Extension economists and most of the production specialists should be familiar with farm economic information and how to get it across to the farmer. This implies first that the Extension staff must have a knowledge of farm economics.

County agents, and this applies also to production specialists, having finished their college courses some ten to twenty years back often have had no courses in farm management, agricultural economics, or marketing. Many others have had only limited work along these lines. They have not had a background of fundamental work to secure either a natural interest in the subject or how to use it properly when called upon. Many of the more recent graduates now engaged in Extension work, while they have had excellent courses in farm management and economics, have not oriented themselves in this subject from

the standpoint of using it for Extension purposes. The first problem we met with was an inadequacy of fundamental training in the economics of production and marketing as well as the proper teaching of these subjects to farmers. We have found it necessary to train our staff both in subject matter and in methods of presentation of the outlook and the farm management information. Farm Economics has been given a prominent place on the programs at our annual Extension conferences. We began four years ago with a two-day program having Dr. G. F. Warren of Cornell present to give a series of lectures on the history of prices and the economic principles underlying price change. Production cycles and trends were also discussed. Each succeeding year we have had a discussion on economic and marketing problems at these conferences. A year ago Dr. Ezekiel discussed with our staff the development of outlook material and how it could be used. Last spring we called four district conferences of county agents immediately following the Outlook Conference at Washington, and spent two days discussing the Outlook material as it applied to the regional situations within our state and in discussing the methods of presenting this outlook information to farmers. The county agents then scheduled meetings in their respective counties to discuss this subject. It met with good response but the matter of specific application to farms in a sound and fundamental way had not yet been reached. Danger was ever present of those who sought to use the favorable information, to do so in a rather universal way. They did not always think to coordinate it in their farm organization so as to establish the most profitable combination of enterprises for the year or for a period of years.

Another series of two-day conferences of county agents, farm management, marketing, and some production specialists, was held early in October and again Dr. Ezekiel was with us and conducted a laboratory study and demonstration with these groups of Extension workers such as discussed here today. Our farming is of a diversified type and covers a wide range from the corn and hog farm to large ranches. We could not confine the organization of our material or the discussion of it to a single farm enterprise, but rather took up the application of this material to the major types of farming in our state. This was the most successful series of study conferences ever held. Every county agent and specialist became more interested in farm outlook material, farm management, and farm economics and the possibilities of securing application of these economic facts through Extension activities. These conferences have developed an understanding of economics and the staff have also received ideas in methods of using this economic material in a budget system as related to farm organization. They have now a better understanding of how to present to farmers the relationships between farm organization and different possible price situations.

The second limitation expressed by Professor Keller was that "Extension workers and farmers have not been shown how to relate farm management information and outlook information." How this limitation has been overcome with respect to Extension workers has been ably presented and clearly demonstrated. From the Extension viewpoint, however, we are interested in seeing our economic information used by farmers to accomplish the result prefacing Professor Keller's paper; namely, improving the income. The next step forward, then, is for the county agent or farm management specialist to so extend

the available information to the farmer in such a way that he can intelligently adjust the organization of his farm to the changing price situations which confront him from time to time. One county agent immediately prepared a budget for two of the common-size and type of farms in his county and made out a table of feed requirements, seed requirements, labor costs, and other factors based upon the conditions in his region. He checked it with the farm management specialist and then presented it to an all-day meeting of a group of progressive farmers in his county. These farmers checked on the county agent's figures and set-ups and then took out their pencils and began figuring on the organization of farms in line with present and long-time outlook trends. They sought to develop re-adjustments that could apply to their own farms which forecasted definite improvements in farm incomes. In other words, the outlook and farm management material which has been organized as expressed here today, had been related one to the other and made use of directly by the farmers themselves. This method and plan was so successful that it is being utilized this winter in many of our counties. At this writing nine counties in South Dakota have had these budget meetings with a group of from eight to twenty farmers. The farm management specialist is making a major project of this work. Eight additional counties have requests in for help from the farm management specialists on the farm budget phase of Extension work in farm management. Farm economic conferences are being held in six counties in which the budget system of developing recommended farm organizations will be used. Out of the present farm budget meetings with groups of farmers, two farm management clubs have been definitely organized and more will follow. These clubs expect to study continuous economic information and at their meetings will consider adapting and re-adjusting their farm organization as changing conditions warrant. Related farm management and Outlook material is being made use of by farmers themselves.

In closing this discussion we would say that effective use of economic material in an Extension way depends upon organizing and relating farm management and outlook data in such a way that more specific evaluations can readily be given to the factors contributing in a coordinated way to income improvement in line with changing economic situations. There is in addition need for further training of all extension workers in the subject of farm economics, and the method of securing its application. To realize the final objective, namely better incomes from farms, groups of progressive farmers should be used in demonstrating and further extending the application of this same economic material.

INTERPRETATION OF FARM EFFICIENCY FACTORS¹

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One of the most common uses of farm accounts has been to furnish the basic data for computing various farm efficiency factors. Such indexes as the number of crop acres handled per man, the machinery cost per crop acre, and the income per \$100 of feed consumed by livestock, have been used with good effect by extension workers to locate weaknesses in the organization or management of farms.

These factors have generally been simple enough to be easily understood by farmers. They have been used effectively by extension men who have constructed so-called "Thermometer Charts" for each of the factors. With the aid of these it has been pointed out to a farmer how his efficiency factors ranked in comparison with the average of others in the same section. Thus a farmer might be shown that the crop acres handled per man on his farm were 10 acres below the average for the records of his county, while his income per \$100 invested was \$5.00 above the average. The inference would be that less labor should be used or more land obtained to raise the acreage per man as high as possible, and that the rate of turnover was satisfactory, but might still be increased.

It seldom has been pointed out to farmers that it is possible to push factors too far in what appears to be a favorable direction. Most research and extension workers have realized that this is the case. But no information has been available as to where an increase in an index of this type ceases to be desirable and begins to indicate an unfavorable condition.

This paper reports an effort to discover what relationships exist between some of the more common efficiency factors and the net farm income and farm profits. As a basis

¹ Paper read at the 20th annual meeting of the American Farm Economic Association at Washington, D.C., December, 1929.

for the study there were available 323 "Farm Business Records" for the year 1927 and 430 for 1928. These records represent a fairly simple form of single entry farm account book which has been used in Iowa for several years under the auspices of the Agricultural Extension Service.

A list of some 20 factors or indexes of the size of the business, or of farm efficiency, were examined and out of these nine were selected and studied in their relationships to the net farm income. These factors were:

1. The acres in corn.
2. The yield of corn.
3. The number of sows bred for spring pigs.
4. The per cent of receipts from livestock.
5. The returns per \$100 of feed.
6. The per cent which the expense is of the total income.
7. The months of labor used on the farm.
8. The acres of crops handled per man.
9. The cost of machinery and equipment per crop acre.

In studying the influences on management returns, after deducting allowances for the farm operator's labor and interest on his own capital, an additional factor was used,—the income per \$100 invested.

Curvilinear correlation methods were used in analyzing the records. Each year's records were studied independently except that the preliminary rectilinear correlation work was dispensed with in analyzing the 1928 records and the curves found the first year were used as the first approximation to the relationships in 1928. This was amply justified by the results, and the very close correspondence of the 1928 to the 1927 curves when the work was completed caused considerable surprise. This indicates that the relationships found are pretty highly dependable, and that they remain essentially the same from year to year.

It was thought, when the work was begun, that the relationships might well vary under different farming conditions. The records were therefore divided into five groups corresponding to the five types of farming areas of the state and the functional curves of individual factors were ascertained for each area. This subdivision reduced the number of records in each area to 70 or 80, which is a pretty

small number from which to derive any general results. Again, however, the curves remained essentially the same for each area for the two years. Their general forms did not change, and the small aberrations which were noticed in comparing the two sets of curves seem easily explainable by the small number of cases. On two or three of the factors definite differences between the various areas did appear and, where these were pronounced, they stood out clearly in both years.

On the charts shown, the 1927 and 1928 curves are combined graphically. The curves are shown as deviations from the averages of the respective series. It was observed that, for instance, a 50-bushel yield of corn had a different significance for the net income and profit depending on whether 50 bushels was above or below normal for the year in question. There were other influences than those studied here which helped determine whether the income was to be high or low. Also different numbers of records were obtained in the different farming areas in the two years. Thus it was necessary to use deviations from the averages instead of the original (or raw) indexes.²

Net Farm Income

By Net Farm Income is meant the income that is left after deducting from the gross income, including inventory changes, the actual out-of-pocket expenses including expenses accrued but unpaid. This sum represents the total remuneration which the farmer receives for his own labor and that of unpaid members of his family, interest on his own investment in the business, and a profit for his management. In one sense it is more important than the profit, which is what is left after deducting items for the wage and

² The averages for the various factors were as follows:

<i>Factor</i>	<i>Average for 1927</i>	<i>Average for 1928</i>
Net farm income	\$1952.00	\$2068.00
Management return	\$ 160.00	\$ 458.00
Acres corn	65	71
Yield of corn, bu.	39	49
Number sows	14	12
Per cent receipts from livestock	88	73
Returns per \$100 of feed	\$ 140.00	\$ 135.00
Per cent of expense to income	54	47
Income per \$100 invested	\$ 13.50	\$ 17.00
Months of labor used	23	22
Crop acres per man	71	82
Equipment expense per crop acre	\$ 2.75	\$ 2.79

interest allowances mentioned above. The Net Farm Income is the total amount the farmer and his family have out of which to get their living. The profit is an index of success in management.

In Figure 1 is shown the relationship of the net farm income to the profit or management return. For all the farming areas combined, the profit increases in a line which is but slightly convex upwards. Other factors such as the acres of corn and the number of sows bred, and the amount

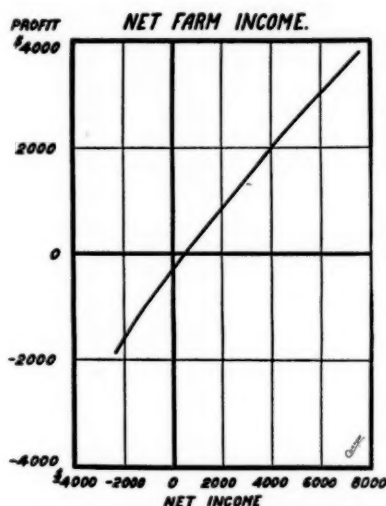


FIG. 1. RELATIONSHIP BETWEEN NET FARM INCOME AND PROFIT.

of labor employed, show that the net income increases more slowly as the business grows. With each added thousand dollars of net income, however, it becomes even harder to maintain the same rate of profit.

An increase in the net income from zero to \$1,000 is accompanied by an increase in the profit of about \$800. But an increase in net income from \$2,000 to \$3,000 was associated with an increase in profit of only about \$550. In studying the relationships of these factors by separate farming areas, it was found that the profit tended to rise most constantly with the net income in the cash grain area. The lag of profits behind net income was most marked in the livestock areas.

Acres in Corn

It is to be expected that the acreage in corn and the yield of corn will be among the more important influences on the net income and the profits on Iowa farms. Figure 2 shows that, for the entire state, the net income at first falls as the acreage of corn increases up to about 40 acres. It should be remembered that these curves represent the variation in the income and profits with the acreage in corn as between different farms. Somewhat different relationships are to be found here from those which would appear if the

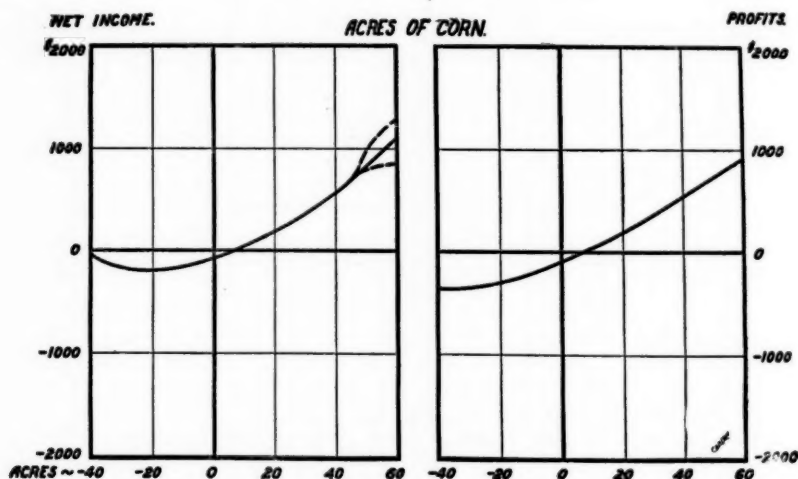


FIG. 2. RELATION OF ACREAGE IN CORN TO NET INCOME AND PROFIT.

acreage of corn were changed on the same farm, with all other conditions remaining the same.

The smallest corn acreages were often found on small farms which represented an intensive use of land. The net income is, of course, computed before any deduction is made for the farmer's own labor, or the use of his own capital. Consequently where such an enterprise as dairying occurs, usually on small farms, the net income is apt to run higher than on somewhat larger farms which represent a more extensive use of land though a greater acreage of corn.

This explanation is borne out by an examination of Figure 3, which shows the relationships of the acreages of corn

to income and profits for the different farming areas of the state. Here it will be observed that the association of small acreages of corn with larger net incomes is most pronounced in the dairying area, and the western Iowa cattle feeding area, and that no such relationship occurs in the cash grain area.

From about 40 acres onwards, the net income and the profits both increase with corn up to about 140 acres. Within this range both the net income and the profits increase

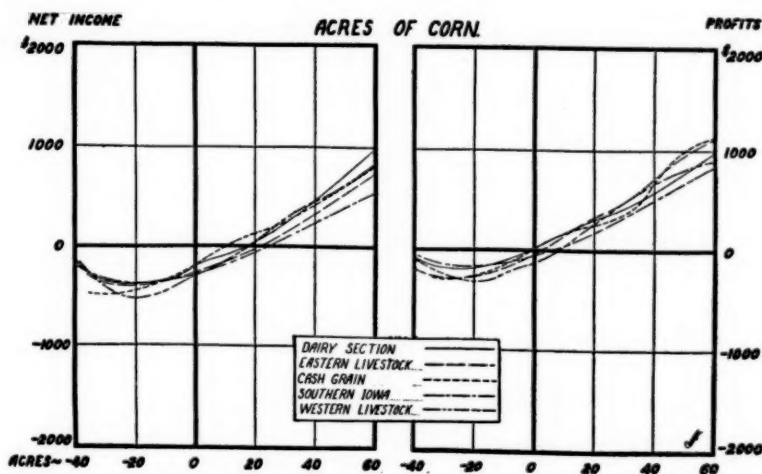


FIG. 3. RELATION OF ACREAGE IN CORN TO NET INCOME AND PROFITS.
BY IOWA TYPE OF FARMING AREAS.

at the rate of between \$300 and \$400 for each added 20 acres of corn.

From inspection of the data, it seemed that beyond a point of about 100 acres of corn two diverse trends began to set in as indicated by the dotted lines on Figure 2. On some of the farms with smoother and more productive land the rise in the curve continued at as great a rate as before up to about 150 acres. On other farms with rougher or poorer land the net income tended to increase very little after about 100 acres of corn, and the net income actually began to decline after about 140 acres. This tendency was most marked in the southern and western Iowa areas. In 1927 the corn in southern Iowa was injured by wet weather

and that in western Iowa by drought. In each case, the largest farms suffered most.

In profits essentially the same trends appeared as in the net farm income. The profits continued to increase more constantly with the corn acreage in the central and eastern Iowa sections than in the dairy section and southern Iowa, suggesting that with the more uniform and smoother land the capacity of the farm manager is the most important influence on the farm profits.

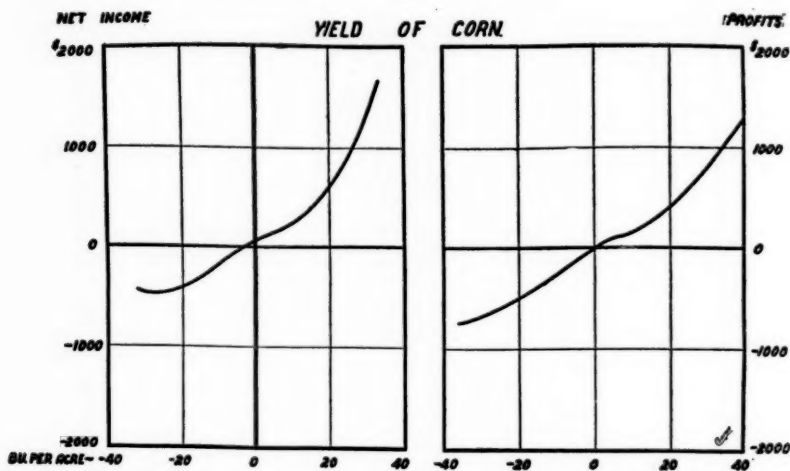


FIG. 4. RELATION OF YIELD OF CORN TO NET INCOME AND PROFIT.

The Yield of Corn

Variations in the yield of corn seemed to have about the same relationship to the income and the profit in each section of the state. Figure 4 shows that the income increases more rapidly as the yield rises. Thus an increase in yield from 20 to 50 bushels was associated with an increase of income of only about \$600, while an increase in yield from 50 to 70 bushels resulted in about \$1,200 more income.

A tendency for profits to increase as the yields rise is also evident in Figure 4. But in this case the rate of increase changes less than in the case of the net income. This is another way of saying that to get a very high corn yield it is necessary to go to more expense, and the expense increases almost as fast for moderate increases in yield as

does the value of the crop. The cases of very high yields were too few to warrant extending the curves past a point about 35 bushels greater than the average, which in 1928 meant a yield of 85 bushels per acre. Up to this point no definite tendency to diminishing returns had asserted itself.

Size of the Hog Enterprise

The number of sows bred to farrow spring pigs was selected to measure the size of the hog enterprise. This is obviously a partly defective measurement, but it was easy to obtain, and the figures on the number of pounds of pork

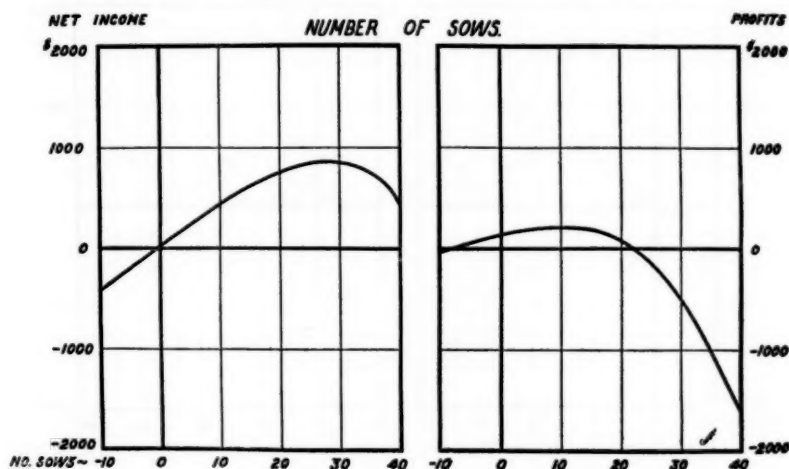


FIG. 5. NUMBER SOWS.

produced which would have been preferable were not available on a large number of the records. Figure 5 shows that the farm income and profits both give clear evidence of a tendency to diminishing returns.

The net farm income for the state as a whole continues to rise up to about 40 sows and thereafter shows a tendency to decline as the hog enterprise is increased still further. This was most noticeable in (1) the cash grain and (2) the southern Iowa areas. In the first case it is probably attributable to competition for labor at some seasons between the hog enterprise and the crops. In the second case it is probably caused mostly by the fact that few farms in this

section are capable of producing sufficient feed for a very large hog enterprise.

The further fact should be remembered that, as the number of sows increases beyond 20 or 25 on most farms the enterprise changes its type. On the farms with a small number of sows both spring and fall pigs are usually produced. Where a large number of sows are bred for spring pigs as a usual thing there are but few fall pigs. Thus the increase in the number of sows does not indicate a proportionate increase in the pork production.

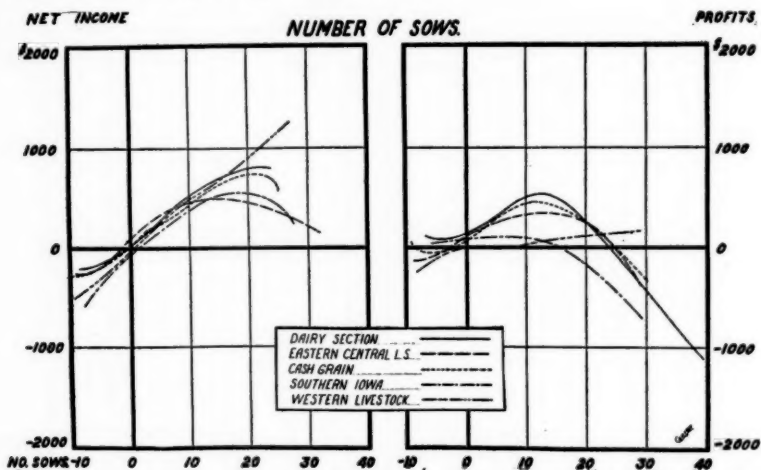


FIG. 6. RELATIONSHIPS OF NUMBER OF SOWS TO INCOME AND PROFITS BY TYPE OF FARMING AREAS.

With an increase in the number of sows the profits at first rise, and then after a size of 25 or 30 sows is passed the profits begin to decline. At first this decline is gradual, but as the herds increase beyond about 40 sows the downward pitch to the curve becomes quite sharp. This probably reflects for the most part the inability of one man, the farm operator, to take care of much over 20 sows at farrowing time and the unsatisfactory assistance received from hired labor. Also the largest enterprises are out of balance with the rest of the farm, especially with the corn production.

Figure 6 shows that the tendency to diminishing profits appears in all sections of the state. But in the western

livestock area it is much less pronounced. This is probably because there is heavy cattle feeding in this section. This was very profitable in 1927 when the curve for this area differed most sharply from the others. Since no other variable included in this study reflects this influence (the size of the cattle feeding enterprise), and since the hog and cattle feeding enterprises are closely associated, it may be assumed that this curve reflects the profits from rising cattle prices in 1927 rather than increasing profits from a larger number of sows.

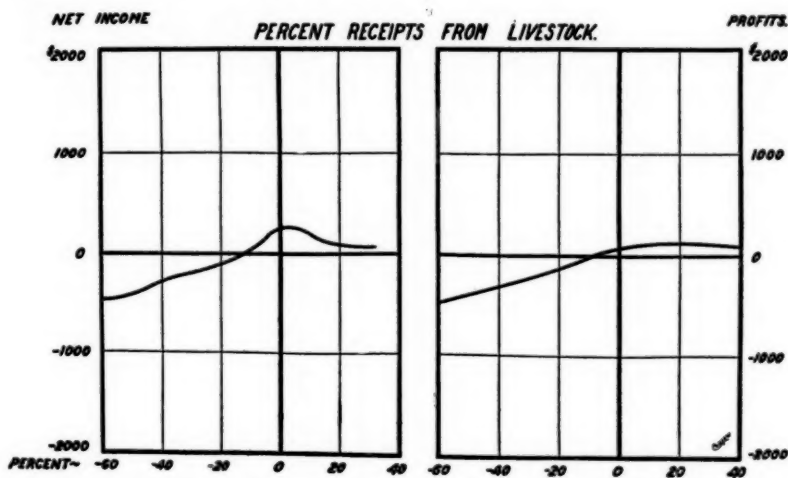


FIG. 7. RELATION OF PER CENT OF TOTAL INCOME FROM LIVESTOCK TO NET INCOME AND PROFIT.

Per Cent Total Receipts from Livestock

Extension workers and others have often put a good deal of emphasis on the percentage of the total income received from livestock sales and products. This was for the purpose of emphasizing the need for a sufficient amount of livestock to consume all feed crops, make use of labor in the winter, and maintain soil fertility. The danger of going too far in this direction has seldom been pointed out to the farmers concerned.

Figure 7 shows that as a larger percentage of the gross income is received from livestock the net income tends to increase somewhat up to about 85 per cent. Thereafter as

the livestock enterprises became too large for the farms on which they were found, the net income as well as the profits tended to decline. Both of these tendencies were most pronounced in the dairy district and the western Iowa cattle feeding area. But the slopes of the curves indicate that this factor was not as important in any section as one would expect from the amount of emphasis that has been given to it.

Returns per \$100 of Feed

A more significant measure of efficiency is found in the income received per \$100 of feed consumed by the produc-

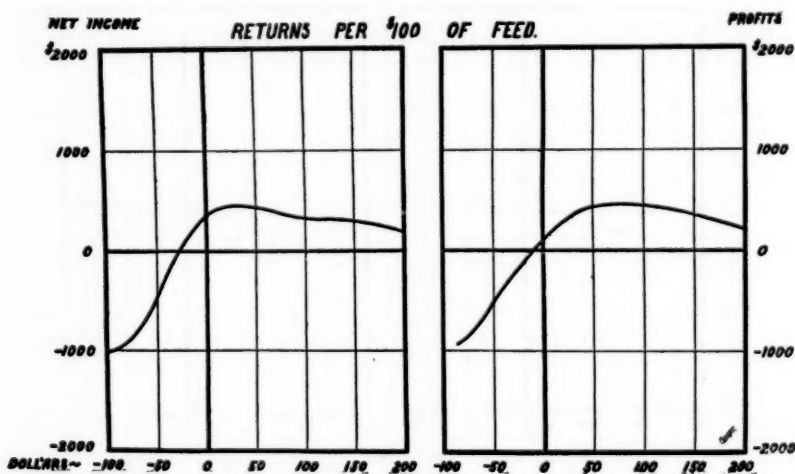


FIG. 8. RELATION OF RETURNS PER \$100 OF FEED USED BY PRODUCTIVE LIVESTOCK TO NET INCOME AND PROFITS.

tive livestock enterprises, that is by the cattle, hogs, sheep, and poultry. This is a fair measure of feeding efficiency and also is influenced by the judgment of the farmer in selecting the most economical ration. Since the feed generally comprises from 75 to 80 per cent of the total cost of operating these enterprises, it will be seen that an income of about \$130 is necessary for each \$100 worth of feed consumed before the enterprises break even financially.

It is shown in Figure 8 that as the returns per \$100 of feed increase, the net farm income and the profit also rise up to a point where the returns amount to about \$200 per

\$100 of feed. Thereafter the income and profit increase at a much slower rate or begin to decline gradually.

The explanation seems to be that higher expenses in other directions are required to get greater income from the feed. With the same feed consumption a somewhat larger income from livestock may be obtained by more care and labor, or by better and more expensive shelter. The highest returns from feed are commonly obtained from high grade and more expensive stock. On the investment in this stock there is a higher charge for interest. The intensification of the livestock enterprises which is necessary to get the largest re-

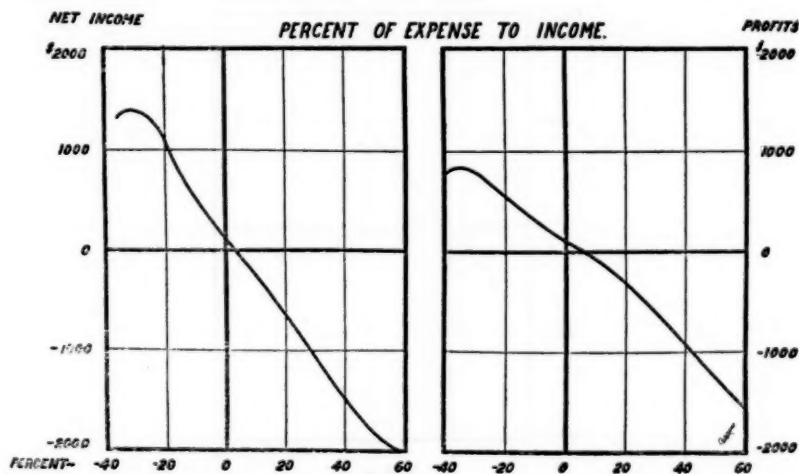


FIG. 9. RELATION OF PER CENT OF EXPENSE TO NET INCOME AND PROFIT.

turns makes it impossible for the farmer to handle as large a business as otherwise, and the gain in efficiency in this direction is offset by a loss of capacity. The farmer's problem is not simply to get the greatest possible return per dollar of feed, but to know the point at which he should stop intensifying in order to get the most profitable balance between efficiency and size of enterprise.

Per Cent of Expense to Income

The operating ratio or the percentage which the total expense is to the total income is commonly thought of as a direct measurement of the rate of net income and of the profit made. As a matter of fact Figure 9 shows that there

is a tendency to diminishing returns here. A certain amount of outlay is necessary in order to exploit a business to its most profitable degree of intensity. Where the operating ratio fell very low, that is below about 25 per cent, it was generally associated with smaller net incomes and profits than when it was around 30 or 35 per cent.

After this point was passed the income and the profit both declined in an almost straight line as the operating ratio increased almost up to 100 per cent. The income, however, declined at a diminishing rate while the profit

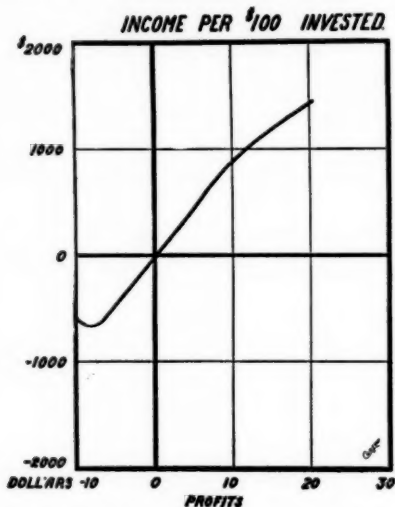


FIG. 10. RELATION OF INCOME PER \$100 OF TOTAL INVESTMENT TO PROFITS.

fell off faster as the operating ratio rose. The change in the apparent relationship at these higher levels probably reflects some increase in inventories from the heavier outlays, part of which might have been charged to improvement instead of operation.

Income per Hundred Dollars Invested

The amount of income received per \$100 invested, or rate of turnover on the capital, is shown in its relationship to the profit in Figure 10. This index also reflects the increasing expense of obtaining a larger income from the same amount of capital. After an initial stage of increasing re-

turns, the curve rises in an almost straight line until the income amounts to about \$20 per \$100 of total investment. After this the expense of getting a still more rapid rate of turnover results in the profits increasing at a less rapid rate.

Incidentally, the financial factors discussed above, that is, the net income in its relationship to the profits and the operating ratio, and rate of turnover,—in their relationships both to the income and the profit, sometimes nearly approach straight line relationships. The physical ratios



FIG. 11. RELATION OF MONTHS OF LABOR USED TO NET INCOME AND PROFITS.

based on the yields of corn, performance of livestock, size of farm, etc., are typically curvilinear, reflecting the influence of diminishing returns.

Months of Labor Used

As the amount of labor used on the farm increased, the farm income tended generally to increase and the profit to follow a less pronounced curve of diminishing returns. But this was only the general tendency and, as is shown in Figure 11, there are some interesting deviations from the trend.

There seems to be a high point in the curve at about 18 months and another at about 31. Low points appeared at approximately 25 and 36 months in the curves for most of

the farming areas. This is puzzling at first. A probable explanation is that 25 and 36 months represent the amounts of labor used on the farms which employ one and two hired men respectively the year round, but are not large enough to hire any labor in addition to this at the busy seasons. Consequently there are some seasons when there is hardly enough work to keep two men profitably employed. On the other hand 18 months represents about the amount of labor used on farms using only the operator and some family labor the year round, and hiring a few months of labor in the busy season. And about 30 or 32 months of labor is used on the farms which are large enough to keep two men busy the whole year and need some additional help in the crop season.

Although the farm income increases markedly with the amount of labor used, it will be noticed that this does not seem to make much difference in the profit, except where there is a very large amount of labor. On these farms the profits decline, showing the difficulty of managing labor profitably in a business covering such a large area as a farm.

Crop Acres per Man

This index was obtained by dividing the number of acres in crops by the number of months of labor used on the farm in the course of the year. This was divided by 12 to reduce to a yearly basis. Roughly it is an inverse measure of the intensity of culture, in most cases, but in some, a direct measure of the efficiency with which the labor was used. Its relationship to the income and profit is shown in Figure 12.

The net income at first rises rather rapidly with the acres handled per man up to about 60 acres. Thereafter the income increases only about half as fast. It may be assumed that the early rise represents partly an increase in labor efficiency with a consequent saving in wages, while the latter part of the curve shows mostly the effect of more and more extensive cultivation.

The profit follows a smooth curve of diminishing returns as the amount of land handled per man increases. This

curve is partly influenced by variations in the capacity of land to make profitable use of labor. The profits fell off most rapidly with increases in the acreage in the rougher sections of the state, especially in the southern Iowa area. In the cash grain area where the land is smooth and one man with efficient machinery can handle a large acreage, and in the eastern Iowa area, the rate of decline was very small.

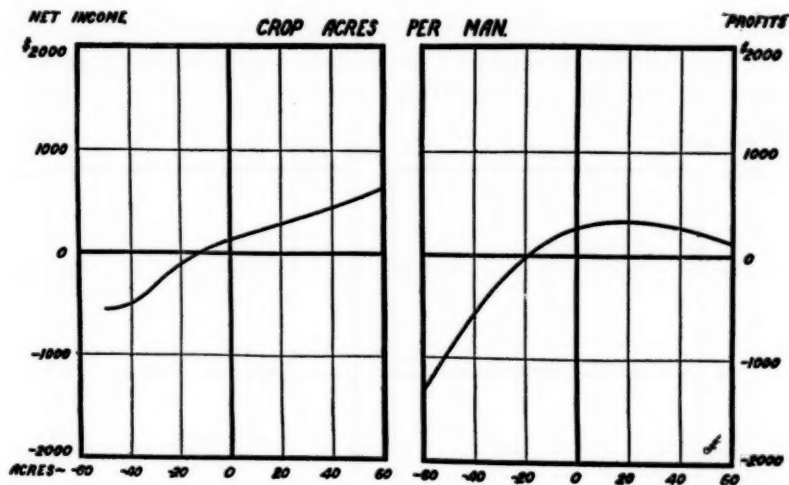


FIG. 12. RELATION OF CROP ACRES PER MAN TO NET INCOME AND PROFITS.

Equipment Expense per Crop Acre

One of the efficiency factors most commonly used is the expense for machinery per acre of crops. Figure 13 shows that while this factor is significant it is usually unimportant as compared to some of the other factors that have been discussed. As the amount of equipment on a farm increases at first the net income and the profit rise up to the place where the expense amounts to about \$2.00 per acre of crops. This point seem to represent the most economical balance between the equipment and the rest of the farm.

As the expense of the machinery increases further, both the net income and the profit decline, suggesting over-investment in equipment. When the equipment expense amounts to more than about \$7.00 the net income rises somewhat, showing that it is possible to increase the receipts by heavy

investment in farm machinery. But at the same time the profits continue to decline indicating that the interest on the added investment is greater than the returns. The decline in profits was most rapid in the cash grain area, where a fairly standard outfit of farm equipment is needed by the more or less standardized crop system and added pieces of machinery are of relatively little benefit.

Estimating Farm Profits with Efficiency Factors

The question is sure to be raised how closely it is possible to explain the variations in farm profits by the use

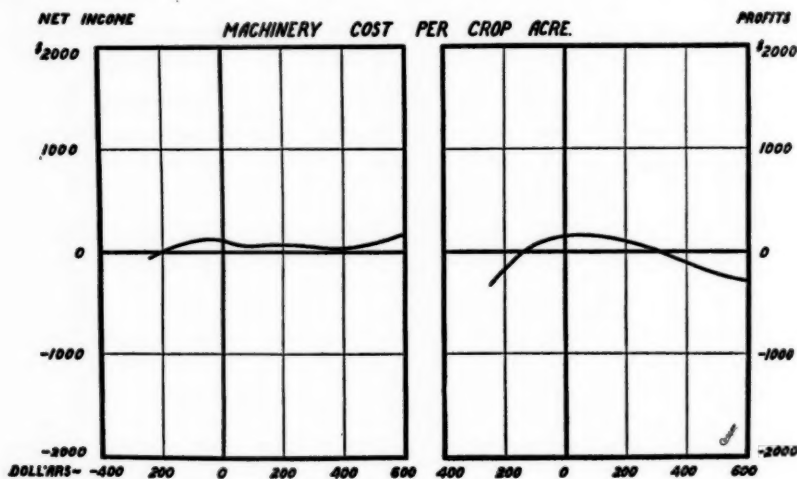


FIG. 13. RELATION OF MACHINERY COST PER CROP ACRE TO NET INCOME AND PROFITS.

of these factors. In attempting to get some sort of an answer to this question the farm incomes and profits were estimated for the 753 farms included in the study.

When the estimated net farm incomes were correlated with the actual incomes a correlation coefficient of $+0.85$ was obtained in the 1927 figures and $+0.83$ for 1928. The standard deviation of the differences between the actual and the estimated net incomes was reduced 46 per cent in 1927 and 44 per cent in 1928.

When the actual and the estimated management returns were correlated, a coefficient of $+0.89$ was obtained for 1927,

and $+ .82$ for 1928. The standard deviations were reduced 40 per cent in 1927 and 42 per cent in 1928.

However, these figures do not quite give an accurate picture of the dependability of the efficiency factors on the ordinary general purpose farm. There were included in the group some unusual farms, whose incomes were affected by influences not measured by any of the factors studied. For instance, in 1927 and 1928 there were wide changes in the prices of cattle. Quite a number of the farms had commercial feeding enterprises. But no index was included reflecting the size or successfulness of this enterprise. In 1928 two of the most erratic farms as far as profits were concerned, each fed in the neighborhood of 200 head of steers, which were sold for very unusual margins above the purchase price.

If two of these erratic cases are omitted in the 1927 data, the standard deviation of the profits for that year is reduced by 44 per cent instead of 40. If three are omitted in 1928, the standard deviation is reduced by 53 per cent instead of 42 per cent.

Use of the Efficiency Factors

The principles on which these conclusions rest are, of course, commonplace to economists. But they are principles which, often, have not been specifically incorporated into the technique of analysis of farm records. This study has merely attempted to do two things. In the first place, it has attempted to obtain a more definite idea of the relationship of each of the factors or indexes studied to the net income and the profit. These relationships have been shown to be generally of some curvilinear form. In the second place, it has demonstrated that the old methods of using these factors in "Thermometer Charts," and assuming a constant relationship between them and the income or management return, is decidedly fallacious. This is particularly true in some of the indexes of physical performance where there is a strong tendency to diminishing returns, or where there is clearly a most favorable point of balance between elements in the farm make-up.

This necessitates a somewhat different approach to the interpretation of farm records. Sooner or later it will be

necessary for extension men to abandon many of the simpler methods of analysis which point out that this factor should be increased, and some other one reduced on a given farm, without indicating any limits to the increase or reduction. It will be necessary to give attention to the more complex problem of obtaining balance between enterprises and of pointing out to a farmer whose records are under discussion, not that a certain index is low or high, but that it has not reached, or that it has been pushed past, the point of maximum returns.

It is possible that charts showing the curves of relationship between the efficiency factors and the net income or profit may prove a more effective and satisfying device than the "Thermometer Charts." Considerable thought is needed, however, in evolving a technique for extension men and teachers of farm accounting and farm management which will make this method most effective. At least the discovery of functional curves such as those presented here for various types of farming areas should introduce much more life into the teaching and the analysis of farm records.

The problem is one which seems very worth while. If the functional curves are known, should it not be possible to point out to a farmer who has kept records for a couple of years not only wherein he has improved, but also the approximate effect of each improvement on his net income and profit? It would seem that this should be the case with some of the factors. With others more caution should be used. The point of maximum returns in an enterprise depends on the managerial capacity of the farmer. As yet no index of managerial capacity has been developed.

DISCUSSION BY C. R. ARNOLD

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Mr. Hopkins has shown in a very able manner that the relation between different efficiency factors and farm incomes is not constant. He has shown that there is a tendency for a declining curve in the relationship between different efficiency factors and farm incomes when carried far enough to the right. He has contended that it is possible for extension workers to mislead farmers through encouraging them to go too far in the development of efficiency factors and push them beyond the point of diminishing returns. Proof of his conten-

tion has been based on nine selected factors applied to a group of farm account records covering two years in the state of Iowa.

A few suggestions which I have to offer are as follows:

First: He states that these records are from dairy sections, cash grain sections, cattle feeding sections, hog sections, and areas where little corn is grown, and apparently cover all types of farming found within the state. There is some question whether sorting records for the entire state for some of these factors give proof of a trend or whether the records are automatically sorted with reference to the type of farming which they happened to be following. Only two factors relating to the size of the farm business were used. These are (1) acres of corn, and (2) number of brood sows. These would be quite desirable if the records from which the data were obtained were all corn and hog farms, but it is hard to justify a relationship between number of brood sows per farm and total farm income when all types of farms from those spending most of their efforts on corn production to others which may be dairymen, poultrymen or any other type are included.

Second: Differing price relations have not been considered, except as mentioned in connection with cattle. It is quite possible that the relative price of different farm products in the certain years that he has selected could easily account for much of the difference that he has shown. We all know that in certain years when the corn-hog ratio is low, the man who sells his crops may show a higher income, while in certain other years with a high corn-hog ratio, men in the same area who feed most of the corn to hogs year after year, would have much higher returns.

Third: One of the undesirable and harmful features of farm record analysis work and analysis reports is the lack of simplicity rather than being too simple, and the inclusion of too many terms which are readily understandable by the individual farmer. There is some confusion in Mr. Hopkins' paper in his distinction between such terms which he uses as farm income, farm profit, profit, net income, net farm income, net profit, management return, and profit for management. I believe the states where the most farm record work has been done have picked out certain items such as farm income, labor and management wage, return per \$100 feed, etc., and stuck with these year after year, rather than introducing too many terms which might be misunderstood or confusing.

Fourth: Mr. Hopkins states that the old method of using these efficiency factors in "thermometer charts" in extension work and assuming a constant relationship between the factors and the income is decidedly fallacious.

The "thermometer chart" to which he refers and which has been used quite effectively in farm management extension work shows a picture at one certain time of a certain farmer's efficiency as compared with another farmer or with certain standards. It was designed and to my knowledge is used to present more clearly the situation to an individual farmer at a certain time, showing what factors are weak or strong in his farm business, and does not necessarily assume a constant relationship between any one factor and the income. Because one factor is lower than another does not necessarily mean that he should immediately seek methods of changing it. The most important feature of efficiency on the farm is the adjustment of all farm enterprise to fit together for the largest return from the whole farm business. What might be advisable

for one farmer might be entirely wrong for another even though their efficiency rating of that factor might be the same. It must be remembered that each farm is an individual unit, with different soil types, different acreage, different labor supply, different amounts of livestock, different market conditions, and different likes and dislikes of the individual operators.

There are two important features in work with farm records. The first of these is the analysis. The second is the understanding of the analysis by the farmer, the interpretation of it in terms of his own farm business, and the application of changed practices learned from this analysis to his own farm organization plan.

I do not agree with Mr. Hopkins' suggestion that extension workers use charts of curvilinear relationships between efficiency factors and income showing the point at which farmers in general should stop increasing their efficiency rather than using the so-called "thermometer charts," showing the static condition of efficiency on the farm at one time with the factors which need improvement.

I believe this paper has established a principle that incomes tend to decline on different farms after a certain degree of efficiency of certain factors has been reached. However, I believe the attempt to show the extension application of the principle and how it should be applied to the individual farm has not been successful. It did not show how the principle will apply to any given farm individually, but only to farms as a group. The point where one farmer should stop increasing the efficiency of any given factor might be far different from the point where another should stop and in both cases it would probably be different from the point established by a miscellaneous group of farms. Extension work must be applicable to the individual farm or it has no effectiveness.

DEVELOPMENT OF COMMERCIAL FARM MANAGEMENT SERVICE

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In accepting the view that the commercial farm management service includes all instances where either the owner or operator of land pays another person specifically for management service, one recognizes several types of management. Furthermore, trends in commercial farm management in one state may fail to give a clear picture of what is taking place over a wider area. Neither did it seem advisable to extend the discussion as applying to too wide an area. With this in mind, a questionnaire was sent to the heads of agricultural college departments representing farm management work in a number of corn-belt states, asking their opinions on a number of questions. The questions and the summarized answers received from nine states may be given as follows.

1. During the past ten years how extensive in terms of acres has been the development of commercial farm management service, that is, hired management that does not directly do labor on the farm? The answers varied from the statement that in Ohio there had been no apparent development except in the case of land taken over by life insurance companies, to the situation in the Great Plains region, especially in Kansas, where it was indicated that probably one hundred thousand acres represented recent development in that state.

2. To what extent has the change been due merely to a change from the old type of rent collection to that of scientific management of land? In other words, to what extent is the change made to meet the old problem of management in a new way? Several men said the change was merely an evolution from the old rent collection customs.

3. Is the tendency toward a consolidation of farms or is it merely a unification of management with the separate farms operated by independent operators? In answer to

this question, it was quite generally agreed that the development was toward a unification of management with the separate farms operated by independent tenants. Some stated that the failure to consolidate farms was due at least partially to the difficulty of securing large contiguous tracts. The statement in one reply relative to large scale farming was that "up to the present time these efforts have been none too successful."

4. Is there a growing tendency for independent operators to gain the advantage of large scale operation through cooperation to an extent which will discourage the development of large scale operations? Replies indicated that there was little evidence indicating any pronounced trends in this direction excepting in the marketing of farm products and in cooperative buying. Four men, however, agreed that there was increased interest along this line.

5. What types of farming in your state seem to lend themselves or do not lend themselves to commercial farm management? A number of replies indicated that grain farming was best adapted to this type of production and along with it the growing of canning crops. The replies in general were that livestock production gave little promise of success unless it might be the grazing of sheep and cattle or the feeding of purchased animals for the market.

6. In light of the recent development of commercial farm management, do you consider men who are entering the field to be of the type who will popularize the project in a permanent way? On one extreme, the men entering the field were characterized as the "promotional" type or those who were "visionary" in regard to the future of agriculture. Another comment may be summarized as "about fifty-fifty." The most optimistic statement was that "the men who are going into the work will probably popularize the project in a permanent way."

These comments are highly interesting in that they present the views of a number of men scattered over a considerable area. Several of those of whom these questions were asked profess that the replies are merely reactions without the foundation of definite facts.

Since in general there is a lack of definite information on

the subject, such statistics as are available need to be used as a basis of judgment. Conditions as they exist in Illinois no doubt reflect the situation as it is in several states of the corn-belt area.

One indication of the extent of the work is found in the fact that a group of over thirty commercial farm managers handling over 200,000 acres of farm land in Illinois recently organized a farm managers association. About one-third of them, handling one-half of the area, have been engaged in similar service, especially on single estates, for a good many years. About two-thirds of the group have entered the work within the past three years and represent new development. Since the recent development represents less than one-half of one per cent of the total farm land area of the state, the real interest in the work lies in its future possibilities rather than in its accomplishment to date.

In regard to the wide interest in the work on the part of the owners of land, the character of the men inquiring about employing management service is worth noting. For example, there is an army man who was never associated with farming, whose wife has inherited several farms; the city business man who was reared on the farm and wakes up to the fact that the income he has been receiving from inherited land is low and that he does not know present day agriculture; the banker who is advanced in years and while he considers farming a good investment is alarmed when he finds that he is unable to cope with present day knowledge and needs in soil fertility, livestock sanitation and other phases of farming representing recent developments; and the city man who has recently invested capital in land and wants to put it on a basis where he will be proud to show it to his friends. These are fair samples of the men who are looking for someone to assume the responsibility of making their farms pay.

After conferring with men of this type, the indication is that agriculture has passed through the period when no thought was given to maintaining the fertility of the land and when the owner was satisfied to take what rent he received, and to look to advances in the price of land for the larger part of his profits. Difficulties which such owners

formerly had with farm lands were apt to be of a legal character and not infrequently some attorney acted as rent collector as well as legal adviser. At the present time earnings on corn-belt land definitely indicate the effect of long continued exploitative agriculture. With these changed conditions, better farm management becomes an urgent need. Owners of such land frequently are specialists in their own profession and want specialized service in the management of their farms.

Another angle of the problem is that there are many owner-operators who are becoming convinced of the value of scientific management of their land. Part of this is the direct outgrowth of good agricultural extension work. They have found that scientific agriculture has helped them to improve the fertility of their land, the handling of livestock, and other similar activities. They are realizing that good farm management is a constant job of many angles and that their farm is not yet a well developed business unit. Some of them perhaps have kept enough records and know enough of the farm management work to have faith in it. While the county agricultural agents or farm advisers have served them well in certain capacities, the increasing membership in farm bureaus in many counties is so great that farmers cannot secure the full measure of the service which they desire, and so they welcome the opportunity of having a competent man come to their farms frequently to help analyze their problems. Thus far the interest in commercial farm management relates to relatively small or family sized operating units.

Another phase of commercial farm management is represented by a group of men with capital who, with their prospective manager, made a careful examination of farm management data at several agricultural colleges a year ago preliminary to forming a large scale farming corporation. The organization became a reality and operated about two thousand acres of land in an eastern corn-belt state during the past year. This organization represents a popular ideal of the present trend in commercial farm management. Relatively few such farms now exist, but interest in them justifies an examination of available data which will throw

light on their possible increase in numbers. The first approach may well be that of comparing the financial burden of large scale farming dependent upon hired labor and management with that of the family farm. In large scale farming operations a large annual outlay for labor and management is required regardless of income. This is well brought out in the example of a three hundred forty acre farm in the corn belt which shows that depreciation in equipment and current operating expenses amounted to a total of \$1,622 in a year. Even at hired man rates, labor for the operator and unpaid family labor amounted to \$2,750. If we assume only a conservative manager's wage for the operator, it would show that the interest, depreciation, and cash outlay, other than that for feed and labor, amounted to only one-third of the total expenses when including the value of all labor and a modest management wage. Although an amount equal to a portion of the wages of hired labor would be necessary to meet family expenses, the illustration serves to point out that the full deficit falls on capital in adverse years when large scale farming employs all of its labor and management. It is probable under corn-belt conditions that the net earnings from the land will seldom equal the mortgage rate of interest on the investment for the average farm since it is the upper strata of farmers who are able to buy land and thus during a period of rising prices are responsible mainly for setting the standard of values. At any rate, there will be frequent years of low farm earnings which are apt to dampen the enthusiasm of the corporate owners unless they are much more successful than the operators of family sized farms. As shown in Figure 1, the large farm returns a good management wage in good years but the reverse in years of poor returns. In so far as management is available on farms of various sizes including many large farms, the actual returns on the investment are about the same for farms of various sizes. (Fig. 2, top).

It is significant that in a recent publication relative to large scale farming released by the Chamber of Commerce of the United States, the following statement appears: "Taken as a group, large scale farms apparently are no

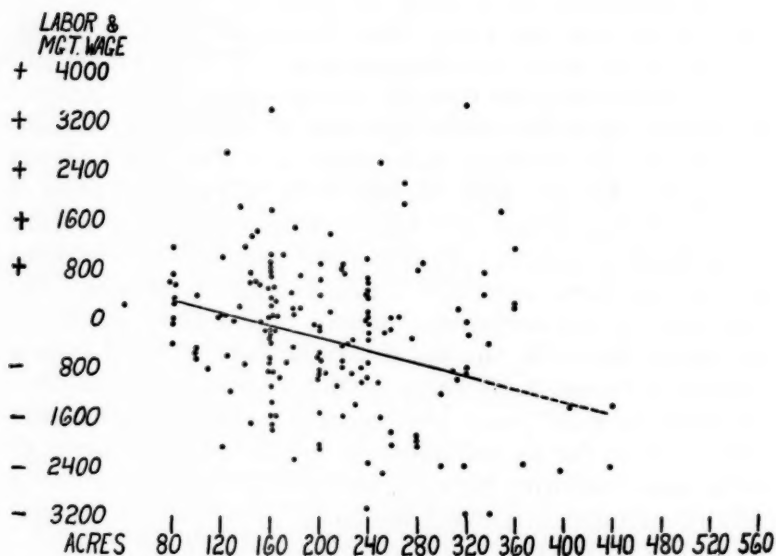
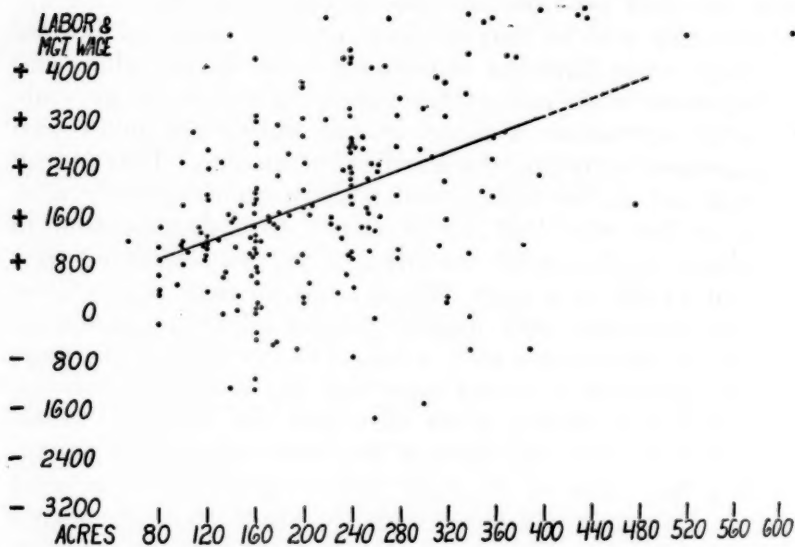


FIG. 1 (Top). RELATION OF LABOR AND MANAGEMENT WAGE TO SIZE OF FARM IN A YEAR OF RELATIVELY GOOD RETURNS

FIG. 1 (Bottom). RELATION OF LABOR AND MANAGEMENT WAGE TO SIZE OF FARM IN A RELATIVELY POOR YEAR.

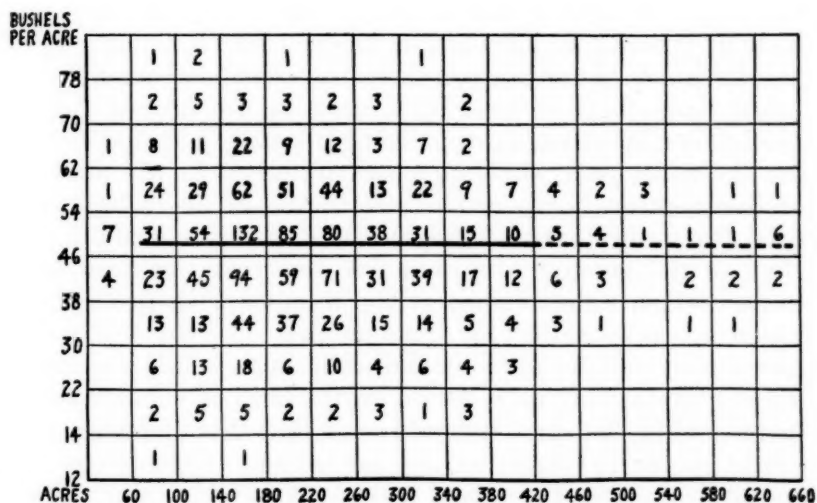


FIG. 2 (Top). RELATION OF RATE EARNED ON TOTAL INVESTMENT FOR YEAR SHOWN IN UPPER PART FIG. 1, TO SIZE OF FARM. INCLUDES LARGER NUMBER OF FARMS THAN REPRESENTED FIG. 1 (TOP).

FIG. 2 (Bottom). RELATION OF YIELD OF CORN PER ACRE TO SIZE OF FARM.

more and no less successful than the average family farm."

Records available from a good many hundred Illinois farms varying in size serve further to point out what seems to be a fair comparison between farms of different sizes. It is frequently stated that the large scale farm operator probably gives more attention to seed, thus insuring better production than is found on the average farm. This statement overlooks the fact that much hired labor which cultivates and cares for the crop is of a lower quality than that found on the average family sized farm. The yield of corn on fifteen hundred farms, as shown by the farm records, indicates that there is no appreciable difference in yields on farms of different sizes unless it may be a slight trend downward on the larger farms. (Fig. 2, bottom).

Many advocates of large scale farming limit their remarks as applying to grain farms. It is pretty well established in the corn belt, on the basis of many studies, that livestock farming year after year is relatively more profitable than straight grain farming. One fact, therefore, to be kept in mind is that the larger sized farms usually have less livestock per acre upon them than farms of medium or small size. This is well illustrated in the investment in productive livestock on approximately one thousand farms for the same year, showing a sharp decline in the amount of livestock on farms as the size increases up to two hundred forty acre farms. Beyond that point, a gradual decline in the amount of productive livestock per acre continues, which reflects some of the handicaps in production which are responsible for the fact that operators of large farms may not be able to maintain successfully as much livestock relatively as is found on the bulk of smaller sized farms. (Fig. 3, top). It would seem that this disadvantage would go far in offsetting any advantage of lower cost of operation on the large sized farms. A similar comparison between the operating expenses per acre and the size of farms shows again a decline in operating expenses per acre as the size of the farm increases from eighty acres to two hundred acres. Beyond that point a gradual decline in operating expenses takes place which apparently levels off to practically a straight line after reaching four hun-

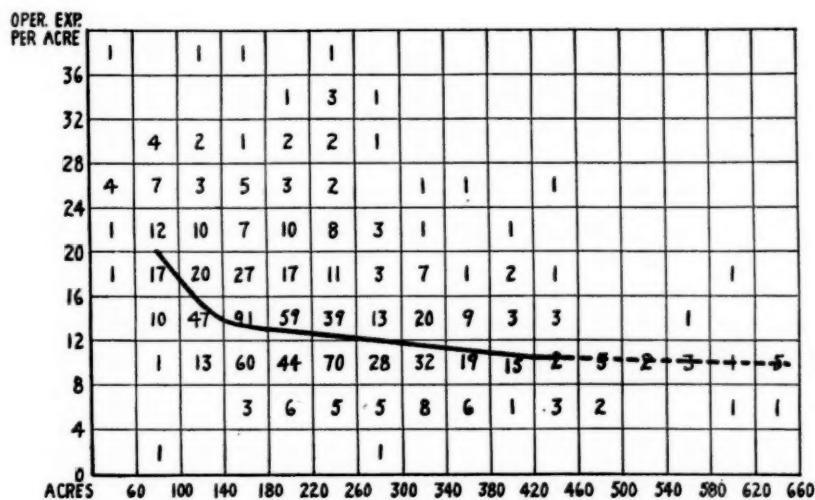
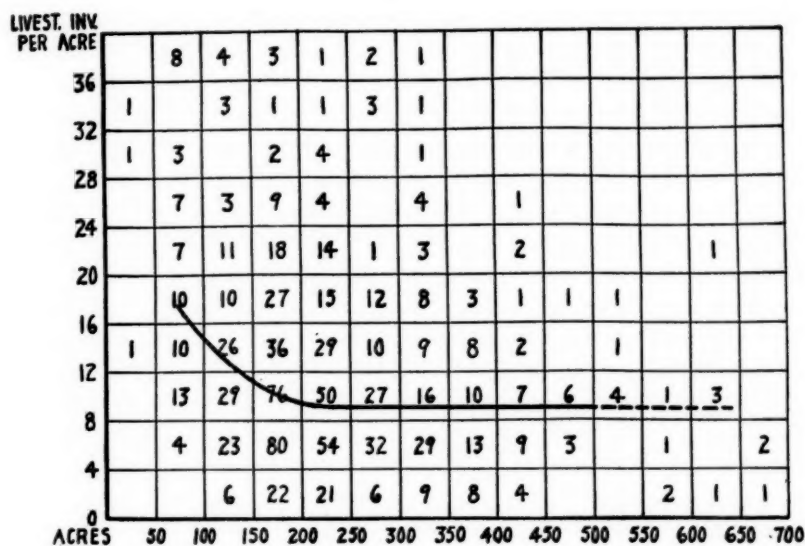


FIG. 3. (Top). RELATION OF INVESTMENT IN PRODUCTIVE LIVESTOCK TO SIZE OF FARM.

FIG. 3 (Bottom). RELATION OF OPERATING EXPENSES PER ACRE TO SIZE OF FARM.

dred acres in size. A considerable part of the decline in operating expenses on the larger farms is no doubt due to less livestock. (Fig. 3, bottom).

These three figures, while setting forth only conditions as they exist on typical farms of the corn belt, will doubtless represent conditions which will be found in other areas except that the size of the unit would need to be corrected to fit the economical operating unit which is found in other sections of the country.

This seems to be a fair comparison since if we are to have more large scale farming the managers are apt to be secured from among the better farmers. To some people developments in mechanized farming promise a revolutionary change in farming, especially in leading to large scale farm units. The combine is frequently cited as an example. Records available on about one-third of the combines in the state show a small number are owned entirely for custom work as was the threshing machine in the past, about twenty-one per cent were owned cooperatively as a means of justifying the overhead, while about seventy-five per cent did some custom work. While many farms are increasing in size to better take advantage of labor saving equipment, this in general does not change greatly the number of men employed per farm even though the total number of farms decreases. This change, then, is comparable to the change in size of farms through the history of the corn belt of gradually adjusting the acreage of the family sized farm as new improvements in operation are made.

One should not close the discussion of large scale farming without noting special types of large farms that represent a considerable acreage in some sections. In this same connection, one has the statement of one of the nation's foremost industrialists who says "Large corporations, whose sole purpose it will be to perform the operations of plowing, planting, cultivation, and harvesting will supersede the individual farmer, or groups of farmers will combine to perform their work in a wholesale manner."

This statement undoubtedly applies to the operation of canning plants throughout the corn belt. One needs only to observe a large number of teams or tractors operating

in the same field to recognize some possible advantages as well as disadvantages, of farming operations conducted in this way. Ground may be so thoroughly prepared and quickly seeded that the weed hazards are greatly minimized over what they are on farms operated with limited labor. On the other hand, the loss of time in travel and during bad weather are obvious disadvantages. This type of operation may offer chances of success in the production of crops of relatively high values per acre and where a regular succession of maturing crops is a necessity to the success of processing the crop. In the canning industry, control of production is essential to the production of good quality of products and the best use of the plant. Also with a relatively small number of companies producing a single product there is some opportunity of regulating the production so as to maintain adequate prices to afford a profit. While it is conceivable that such agricultural production might develop in accordance with the demand of the American people to get their food products from tin cans, it is significant, however, that one canning plant has directly operated ten thousand acres of land in Illinois and has extended its operation to include six plants, expects to obtain the products for the additional plants on a contract basis with planting carefully supervised. Another large company that has grown its own crops for several plants is considering returning to the contract basis.

Sugar plantations and certain other large agricultural undertakings lend themselves to centralized management both because of the processing needed in connection with putting the final product on the market and because of the wide degree of difference between the ability of management and that of labor.

In purely grain farming regions in the western part of the corn-belt states, new extensive farming corporations frequently arise operated under central management and hiring large numbers of men. While some such large farms began many years ago, to the writer's knowledge, balance sheets which are convincing and which prove the economic success of large scale farming ventures in the north central states have not been publicly presented. The following

quotation from a letter from a western corn-belt state bears on the question: "In the state of _____ two attempts in commercial farm management have been made. One of these attempts failed because of the inability of the manager to handle the situation. The other started August 1, 1929, and terminated this last week when the manager was offered other employment at a materially higher salary."

It would seem that continuity of management is one of the serious problems of large farms dependent upon hired management. It is at this point where the farm managing corporation would seem to have a place in assuring continued management.

This survey of conditions surrounding the development of commercial farm management indicates the diversity of conditions to be considered. Any attempt to analyze the trends which are taking place make it advisable to classify the different types of commercial management for separate consideration.

Show farms represent a considerable body of land which may well be regarded as separate from land which is being operated primarily for profit. Country homes of city business men will undoubtedly increase in number about our large cities. The extent of such properties, of course, is small compared with the agricultural area of the country. Their significance from the standpoint of constructive farm management work is not great. They no doubt afford well paying positions for a good many men engaged in their management. On the other hand, some well-intentioned graduates of agricultural colleges who are anxious to be associated with a constructive piece of work have found the "country home" farm an unsatisfactory outlet for accomplishing such an objective.

It seems advisable, therefore, to distinguish country homes from a classification showing the progress being made in the commercial management of land upon a constructive, long time basis.

In order to distinguish the difference in management functions and their development with different classes of farm lands which appear to afford a field for commercial manage-

ment a useful classification may be based first, upon capital control as follows:

Centralization of capital:

1. "Distressed land" farm management
2. Estate farm management
3. Corporation farm management

Decentralization of capital:

1. Group farm management
2. Cooperative farm management

The difference in the actual managerial function within the separate classifications will be brought out in the following discussion.

The term "distressed" land as used in the classification refers to land that has fallen into the hands of mortgage holders and which, because of its extent, is an important element in commercial management. This development, primarily of the past decade, would appear to overlap some of the other classifications, but there is so much similarity in the handling of such land that it would seem advisable to leave it in a group by itself. It might even be segregated from any classification having to do with permanent development in commercial farm management service because of the temporary character of the management over a particular piece of property.

Insurance companies, banks, and other institutions which are holding farms obtained as a result of the agricultural land boom and the succeeding depression, are frank in admitting that they are holding this land against their wishes and the reason for not liquidating is that they want to retrieve as far as possible the capital which it represents to them. The objective in the management of such land, therefore, is quite different from the objective of the corporation organized specifically to operate land.

The greater part of this land is operated by tenants. One of the largest undertakings of this kind has been that of insurance companies and other loan agencies who have become owners of large areas of distressed land. Even under these conditions, however, the present owners regard their tenure as of temporary nature. Even where land has

been fully equipped and operated by hired labor, the experiment has not gone far enough to warrant any statement relative to its success or future development. The management over distressed land in general lacks the characteristics of constructive agriculture. While it is relatively important at present and while it probably will be an element in agriculture at all times, its importance should gradually diminish as the date that marks the recent depression in land prices recedes.

The term "estate farm management" is used to refer to land owned by a single individual or undivided hereditary estates where the full time of one or more men is engaged in the management of the land. The manager may be employed to direct hired labor or to supervise the tenants upon separate farming units. Estates of sufficient size to occupy the time of a manager in the corn belt, however, seldom are operated with hired labor. The centralization of capital usually means a definite management policy, which is not true where many owners are involved. Also such estates usually follow the prevailing type of farming of the region. The management of many of these estates in the past has involved mainly the collection of rent and maintaining on the farm such meager improvements as were necessary for grain farming. Many of these estates passed into hands of the succeeding generation in exploited condition. Frequently new hereditary owners recognize the need of improving the agriculture and have set about to secure such management by employing a man who is well versed in the technical and scientific aspects of farming. In some circumstances, improvements involve large amounts of new capital with expenditures following definitely worked out lines somewhat as would be done in the refinancing of a manufacturing plant or other business undertaking. The progress toward a permanent system of farming which is being made upon some of these large, hereditary estates which have remained in the family since the land was taken up from the government or was purchased at a low price, indicate that it will remain a factor in commercial farm management for some time. On the other hand, there is

little indication that such estates involving any large acreage of land are increasing in number.

The term "corporation farm management" is used to embrace all farm land operated under hired management by corporate owners. While such farms may be operated either as tenant farms or with hired labor, the function of management usually differs in important respects from that of the preceding classification. The former is more generally concerned with the management of tenanted land under limited control, while the latter is most frequently concerned with the management of hired labor where a high degree of control is exercised. The former usually represents many more units of operation with a given land area while the latter is apt to represent centralization of the units of operation, and frequently highly specialized lines of production are followed, as in the production of sugar, wheat, and canning crops. Many corporation farms are developed largely as an advertising feature in connection with certain businesses as retail dairying, stock foods, and the like. Many of them, such as coal lands, represent the holdings of business corporations whose primary occupation is something other than farming.

Corporation farms, therefore, include many types of farms and while little information is available relative to actual earnings, apparently those farms associated with the production or processing of a specialized product have the greatest stability, better earning capacity, and are increasing in numbers. In general farming, the frequent financial reorganization that takes place among such farms leads to the conclusion that they cannot withstand adversity as well as the family sized farm for the reasons previously stated.

Group farm management, by which is meant the central management of farms belonging to a number of different owners, represents an important recent development in the commercial farm management of the corn belt. Such management may be employed either to direct hired labor on the farms, or to supervise more or less directly the tenant operators of separate farm units. The latter of the two types of operation at the present time represents the greatest development. Most of this development has taken

place within the past five years. Since many owners are involved many different management policies exist in the work of a single manager. Approximately half of the land brought under the group farm management plan in Illinois has been in the hands of banks, part of it owned by the bank's officers who, in their advanced years, seek to be relieved of the responsibility of the direct management of land.

Other farms represent the increasing acreage which may be described as trust land. There is no reason why the management of trust land will not represent a larger problem if those in charge of it are successful in its administration. Absentee land owners have in the past placed considerable dependence upon the banks for the protection of their interests. The slight management which such land has received has made more pronounced the need for a high grade management service. Within this group and also among the owners of small amounts of land there are always a few men who have never gotten along well with their tenants. There is little reason to believe that these men will get along better with a hired manager of their land, except that such managers are in a better arguing position than the tenant. Many managers of groups of farms recognize that frequently they are better off to forego the acceptance of the management of a particular farm because of the impossibility of rendering the service desired and expected. As a matter of fact, men who have most satisfactorily established themselves in the new work are handling a pretty highly selected group of farms either from the standpoint of the fertility of the land, equipment of the farms, or attitude and financial position of the owner.

Having pointed out that group farm management represents one of the largest developments of recent years and that it is concerned with constructive agricultural development, some reference may well be given to the character of the men who are succeeding in this type of service. While comments received from several states indicated that some of the men entering this service are of the promotional type, one feels fortunate in being able to say that in Illinois the majority of the men entering this service have been

successful county agents or "farm advisers." Under Illinois conditions, this means they have had at least five years of successful experience following graduation from an agricultural college before becoming county agents and they usually have spent five years or more in county agent work before entering upon the new type of work, and some of them have been successful farmers with an equal amount of experience since graduation from college.

It is rapidly being found out that the "glad hander" who can sell his service of managing a farm is not permanently established in the business. The general interest in the work has made it easy to sell but the real test comes in keeping the service sold to the same individual. In fact, the organized group of farm managers in Illinois came into being for the purpose of safeguarding common interests in their profession more than for any other reason. Enough men of the right type are entering the service to establish it on a permanent basis, it is believed, and it seems there is adequate business available for at least one fully qualified worker in each of the larger and more productive corn-belt counties.

The unit of land which seems adapted for the work of a man of the right type with perhaps an office helper is about ten thousand acres, made up with farms averaging from two to three hundred acres in size.

The four classes of farm management discussed thus far have dealt only with tenant land or land operated by hired employees. This represents less than half of the total land area throughout the corn belt. A very pertinent problem remains as to whether commercial farm management has a place on farms operated by the owner or by tenants whose land-lords are fairly competent in the management of the business.

Cooperative farm management, or "Farm Bureau Farm Management Service" consists of farmer cooperation in employing a trained man to assist in keeping records, in making a business analysis of the farm, and helping to develop plans for its operation. While there is no compulsion in the execution of any plans which may be drawn up, men who are willing to pay for this type of service are the

type who are going to use the records as a basis for improved farming. Cooperative farm management service in Illinois now engages the full time of three men in field work, rendering service to about six hundred forty farmers, representing a combined acreage of one hundred forty thousand acres and an investment of over thirty million dollars. It is progressing in too satisfactory a way to escape attention. In the eight counties where this work is now being conducted the request of farmers from these and adjoining counties to enter the service indicates that the service has sold itself. The original organization, started about five years ago, signed up members for a new three year period a year ago and within the same area the original membership was doubled without difficulty. Its development depends primarily upon securing the service of a field man competent to render the best that is known in farm management service. The statement of one farmer who has cooperated in the work for five years, that he saw no reason why this type of service would not spread throughout the corn belt, echoes the thought expressed in various ways by a number of these co-operating farmers.

An examination of Smith Lever extension work seems to indicate that cooperative farm management service is a logical development. When Smith Lever extension work first began, the cooperation of the farmers was secured most frequently by approaching them in regard to the thing in which they were most interested. The man who was interested in seed corn was given further assistance in improving seed corn production. Likewise, good hog producers were given further assistance in improving their methods. In other words, extension work helped men improve the thing in which they were already most proficient or most interested. The study of farm earnings on many farms indicates frequently that a man who is especially successful in the production of some one crop or class of livestock, is not successful in his farming operations as a whole. Often some vital weakness is responsible for low earnings even though other parts of the farm business may be above serious criticism. This being true, there should come a time when a careful analysis is made

which will help the individual farmer to improve the entire farm business. Success in farming does not consist in exceptional ability in some one line, but of well balanced organization and operation of the entire unit.

Good farm management is a continual job requiring study and analysis each year. It calls for more detailed attention than the county agricultural agent is able to extend to all farmers who are cooperating with him. Consequently the employment of a man who will make frequent calls at the farm and assist in the keeping and analyzing of farm records and perfecting plans for the better operation of the farm would seem to be a logical development. In so far as this work succeeds, and to the present it seems to have no negative aspects, it tends to perpetuate the family sized farms on a satisfactory and permanent basis. It should not be overlooked that cooperation on the part of operators of family sized farms may secure to them many of the claimed economic advantages of large scale farming.

In conclusion it appears: (1) that the management of distressed land constitutes a large element in present commercial farm management, although in general it does not represent constructive development; (2) that although there is some tendency toward an increase in the number of corporation farms, the most successful appears to be those that engage in the production of specialized products where processing is closely associated with the growing of the product; (3) that aside from highly specialized production there appears to be limited success in employing both management and labor; and (4) that management service for the family sized farm, that is, the farm providing full employment of about two men under corn-belt conditions, appears to be gaining in a constructive way both in the management of tenant farms and in the cooperative management service to independent operators, who may be either owners or tenants. While the most pronounced development appears to be commercial management for family sized farms, this does not mean that where formerly there were many farms one hundred sixty to three hundred twenty acres in size, in the corn belt, there will not be many farms three hundred twenty to six hundred forty acres in

size operated by the more outstanding operators who will successfully direct more than the average amount of farm labor. In other farming type areas of the United States, like changes in size are apt to take place based upon the economic size of farming unit for the area under consideration. This, however, is evolution instead of revolution in agricultural practice.

DISCUSSION BY C. L. HOLMES

BUREAU OF AGRICULTURAL ECONOMICS

Professor Case has elected to give this title a broad interpretation, making it cover all instances in which the managerial function is separated from the labor function and in which it is paid for by the owner of the business. With this broad content his classification becomes of particular interest. It is to be noted that he divides the commercial farm management function into two general classes on the basis of the ownership of capital—centralized and decentralized capital organization, he calls it.

Practically all the cases of real large-scale farming on the single unit basis will be found under his first group—that involving centralized capital. Professor Case agrees with most others who have studied the matter that cases of really large capital concentration involving hired managership are relatively rare. All of his charts based on conditions in Illinois bear out this fact. To be sure, the development of large-scale or corporation units depends very much on local conditions. Certain farming areas offer much more encouragement for it than others. Illustrations of this are to be found in the extensive wheat-growing regions of Kansas, North Dakota, and Montana.

Professor Case's studies indicate another significant thing with reference to the type of management provided by banks and other credit agencies recently loaded with foreclosed land. In reality there is very little farm management involved in this sort of service. These agencies evidently regard their situation as a temporary one and are naturally more concerned with maintaining the land in a salable condition than with setting up permanent plans and facilities for operation.

When we shift to Professor Case's other group, namely, that involving decentralized farm capital, we probably find a more significant field of this development although, to be sure, cases even here are relatively rare and embrace a very small fraction of our total agricultural resources. Potentially, however, the two sub-classifications he gives here represent things of tremendous significance, at least in certain portions of American agriculture.

It might be well to examine for a moment the relative significance of what we understand as "management" as it applies to these two groups. Actual management should, I believe, be defined as the responsible function of judgment-forming and execution of decisions. On examination we find that this function is involved only in the first of these two groups. The other is merely

an advisory function which leaves in the hands of the individual farm operator the responsibility of making and executing decisions.

Chain farming, or "group farm management" as Professor Case terms it, has long existed in certain forms in many parts of the United States. The situation which has developed since the war is probably giving it a vastly increased significance although as yet its increased development is to be observed in only modest proportions. Its greatest importance for the future would seem to lie in the control of rented farms. Nearly half of the agricultural area of the United States is now operated by those who do not own the land. The skill and effectiveness with which this rented land is actually managed varies greatly but it is safe to say that the rented farms of the country offer by far the greatest problem in management. If the bulk of this land could be placed under management which would assure its being farmed at a level of efficiency as far above the normal as we know is possible from the observation of the best examples of farming in every community, agriculture would realize a tremendous advance.

The first important question in a consideration of such a proposition is as to whether managerial talent is available by which this change in farming on rented land could be brought about, provided its transfer to and concentration under such management could be realized. The second important consideration is whether, indeed, the super-manager, if he exists and his services can be obtained, could really have an opportunity to realize on his super-ability. In other words, is it possible to organize tenant farming in a way to preserve the family unit of operation, at the same time realizing the results of high-type management? It is probably true that the law of diminishing returns applies quite as realistically with reference to expansion in the body of resources under a given manager as in any other proportional relationship; and while share-renting or other forms of profit-sharing may go a long way toward counteracting this thing, nevertheless, there is a real problem in making the efforts of the super-manager really effective.

Another question arises as to whether agriculture so organized will offer returns to unusual managerial ability sufficiently high to draw a considerable supply of it away from other industries where such talent may be better paid. I am of the opinion that this is a minor phase of the problem, at least in the long run. While the entrepreneurial opportunities in agriculture, even under this type of organization, are more modest than many of those in industry, it would seem that there is enough native ability in the agricultural population whose owners would be attracted to these opportunities so that we need not worry on this score.

In this connection, Professor Case's remarks with reference to the necessary training and experience of these men are of interest. He says that the men actually engaged by banks and other credit agencies for these manager jobs usually have about ten years of experience in county agent's work, farming, and the like, before they undertake this responsibility. I would like to suggest that experience is not the only prerequisite for success in this job. If half this ten-year period in which the man is gaining maturity were devoted to training and the other half to experience, we might have a better product. It would seem that our agricultural colleges should be seizing the opportunity to offer special

courses of training for men fitting themselves for this type of work. Nor should this training be limited to the under-graduate years. These jobs involve a sufficient amount of responsibility and should involve a high enough compensation to warrant a man spending two or more years in advance training covering the essentials in the economics, the science, and technique of his job.

It seems to me that the real deterrent of development of this sort of farm management function is the owner of rented land. In many cases the owner is not financially able to engage the services of such a man nor to finance the kind of farming which the higher management will demand. There is, of course, much sheer human inertia to be overcome, even on the part of those who have large numbers of farms and who might well profit by engaging such a manager and who have none of the other problems of concentration of ownership and of capitalizing to meet. The mere fact that the great bulk of our rented land is held by those who own from one to only a few farms makes this problem doubly difficult. Any development in this direction is going to take time. We should not condemn it as an insignificant thing merely because it is slow in coming.

As to the other phase of Mr. Case's second group, that which he terms "cooperative farm management," and which I have called "farm management advice," it is also of great potential significance, more particularly with reference to the more efficient running of owner-operator farms. The Illinois project which has justly attracted so much attention is a demonstration of what may be accomplished by purely advisory work looking toward better farm management methods.

THE RELATION OF THE FLOW OF POPULATION TO THE PROBLEM OF RURAL AND URBAN ECONOMIC INEQUALITY¹

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Owing to the generally unsatisfactory results of a paper which is read by someone or other than the author, this paper contains certain data supporting the conclusions which could have been presented in a more generalized manner had the author been present to supply more exact information when subsequent discussion rendered it desirable to do so.

The ultimate acceptance of the theory, which is suggested by the local study of which this paper is a summary, as applying to other regions or to the United States as a whole must await further studies. Perhaps the forthcoming Census may reveal evidence which is not directly obtainable from previous Census reports. It is hoped that the results of this local study may stimulate other and perhaps confirmatory studies elsewhere.

Present-day economic theories have their origin in the conditions of a century ago. At that time, among other theories which were advanced, Malthus gave us his theories of population as an explanation of economic distress. During the same period Ricardo gave us his theory of rent as a result of the discussion over the part played by the bankers through whose hands the exchange of property values was passing.

During the century which has passed the possible significance of the time-relation of these theories has been overlooked. Religious institutions opposed the theories of Malthus and the opening of the new world diverted attention from them. The "iron law of wages" conclusions which were deduced from Ricardo's law of rent became the bone of contention between socialists and those who were in dis-

¹ A paper read before the Southwestern Division of the American Association for the Advancement of Science. Tucson, Arizona, April 22, 1930.

agreement with socialistic theories. During this period the attention of economic theorists was diverted from the circumstances which caused Malthus and Ricardo to promulgate their theories.

While theorists were occupied in this manner, practical reformers were attacking the problem of economic inequality in the hope of curing the resultant distress and discontent. Cheap credit was the first remedy proposed. Raiffeisen in 1848, a year of great upheaval in Europe caused by economic inequality, founded his cooperative credit movement. Credit has become cheaper since his day, due perhaps more to general economic progress than to his efforts.

The next turn of the wheel brought cooperative marketing to the front and by the opening of this century the world was applauding the results obtained in Denmark and other northern European countries. Today we have cooperative credit and cooperative marketing highly developed in most commercially advanced countries. What gains have resulted have been absorbed by land owners, thereby increasing fixed costs and accentuating rural and urban inequality with each downward swing of the business cycle.

Another proposed remedy was increased production. During the past half century the science of the world has been placed at the service of agriculture, heavily endowed by governmental support. Increased production has certainly been attained, but its utter failure as a remedy is evidenced by the present plea of the Federal Farm Board to reduce production 10 per cent in 1930. Better evidence of the failure of all remedies to date for the ever present rural and urban economic inequality need not be offered.

Three years ago a study of rural credit in Utah was narrowed down to Cache County, a relatively isolated mountain community in which is located the Utah State Agricultural College. The evident relation of rural credit to other economic phenomena caused the scope of the study to be extended to include all phases of economic life. No one connected with the study had any idea that a suggestion as to a basic and enduring cause of economic inequality between rural and urban areas would come from this study.

The first step was a study of the trend of farm mortgages

in Cache County as shown in the Census reports. These were found to have increased from 18.7 per cent of the value of mortgaged property in 1910 to 41.6 per cent of the value of mortgaged property in 1925. In the same period the increase for the United States was from 27.3 per cent to 41.9 per cent. With whatever area compared the *greater* increase in Cache County was outstanding.

Usual explanations of farm mortgages proved inadequate to explain this *faster* growth of farm mortgages in Cache County. The usual reasons given with the answers are as follows:

1) "Cache County is merely catching up with the general level of mortgages after having made a late start." No person or community incurs debt merely for the purpose of being as heavily burdened as others. The question is still: What became of the excess increase in mortgages?

2) "The increase of mortgages is justified by the increase of productivity of Cache County." Comparisons failed to show any increase in net productivity in Cache County which is greater than may be accounted for by general economic progress which would affect all areas equally.

3) "The increase in mortgages is due to the purchase of farms by fathers for their sons from neighbors who cannot farm so economically." If this is the fundamental cause for the greater increase why is the increase persistent since 1910; if true, there should be a reduction at some period during these two decades when the increased productivity of the farms in the hands of the more efficient would provide the means for repayment.

4) "The increase of mortgages is for the purchase of production capital—machinery, buildings, and live stock." Comparisons showed that the increase of capital in Cache County has been at a slower rate than in other rural areas, whereas the mortgages in Cache County have increased at a faster rate than in those same rural areas. Also, if the greater increase of mortgages has been for the purpose of capital purchase to an extent which is not true elsewhere, then over the period since 1910 the product of this increase of capital should have been available for the reduction of

this indebtedness, whereas on the contrary the mortgages have been increasing at an accelerated rate.

5) "This greater increase of mortgages is for the purpose of obtaining a better standard of life." Comparisons showed that the increase of standards of living in Cache County during this period was at a slower rate than was true in the other areas studied, although the rate of increase of mortgages was greater. Also, standards of living in Cache County have been increasing at a slower rate than general economic conditions have permitted for rural United States as a whole, judging by the survey of household and farm equipment conducted by the General Federation of Women's Clubs.

These last two answers, those relative to the purchase of capital and a better standard of living, are subject to the justifiable criticism that standards of living are mental and that the value of capital equipment is relative. It may be justly claimed that the expenditure of large sums for religious activities and for education is for Cache County as much a part of its standard of life as it is for another region to spend its money on radios, automobiles, and fine homes.

To meet that criticism a comparison was made of the trend of improved farm land per capita in Cache County as compared with the trends in other farm areas which are producing for the same general, competitive markets. If there is no advantage in per acre productivity for Cache County, a relative decrease in improved farm lands per capita would indicate a decrease in net productivity per capita which would be available for the purchase of either productive capital or an improved standard of living. It was found that the acreage of improved farm land per capita is decreasing in Cache County, whereas in competing rural areas this acreage is increasing.

If this decrease in improved farm acres per capita is the result of increased productivity per acre due to a shift to more intensive crops or products, then there should be a progressive specialization on the farms of Cache County provided that this shift is not due to conditions forcing that specialization entirely apart from increasing per acre pro-

ductivity. However, investigation revealed that the average number of different cash crops per farm increased in the past decade.

Thus, from every angle the usual explanations of farm mortgages proved inadequate to explain the *greater* increase of farm mortgages in Cache County. The study of the causes of this excess led to a study of the effects of emigration upon this problem. One of the outstanding economic phenomena of Cache Valley is the high birth rate among the Mormons (Church of Jesus Christ of Latter Day Saints) who comprise about 90 per cent of the population.

Economic theories in the field of international trade recognize that the departure of an emigrant who possesses capital is an economic loss to his native home if he takes his capital with him, a loss entirely apart from the decrease of the labor supply which results. It is also recognized that there is a definite flow of goods and property rights when emigrants remit to their parents at home. It is also recognized that one very important "invisible" item in international trade is tourist expenditures.

No figures of inter-community migration are given by the Census reports. But by comparing trends in the percentage of children of school ages to total population in Cache County with those of other rural areas, it is evident that Cache County has had an emigration larger than those other regions have had. A comparison of vital statistics furnished by the health departments of various states gives similar evidence of a necessarily heavier emigration.

Assuming that the theories of foreign trade relative to population movements and trade movements are true, this would indicate that the reason for the greater increase of mortgages in Cache County may be explained by this greater emigration, the mortgages being given to people outside of Cache County who would supply to emigrants upon their arrival in other regions the value of their property rights in Cache County. This result would be similar to the sale of securities on the open market in the country which possesses a credit balance in international trade.

Comparative studies of Cache County with other areas

cannot be pushed further because of lack of data relative to migration except for estimates which are furnished annually by the United States Department of Agriculture for the United States as a whole. Were it not for the assistance of the Mormon Church it would have been impossible to measure the movement in Cache County. That Church keeps a wonderfully accurate check on all of the affairs of its people.

Of the forty-four wards (local churches) of that demoniation in Cache County, twenty-two furnished figures on the movements of their members for the year 1928. The Presiding Bishop at Salt Lake City furnished statistics by Stakes (similar to Districts in the Methodist Church) back to 1900. And in one ward a name-count was extended back to its settlement in 1870. This evidence pointed to an annual net emigration for nearly twenty years of about 500 persons per year. This net emigration from Cache County has been in progress since 1890. Prior to 1910 the migration was mainly into southern Idaho and western Wyoming; since 1910 the migration has been into the cities, principally those of southern California.

The County Assessor's assessments of real property in 1928, balanced by his studies of the relation of actual sales to appraised value, and compared with the 1925 Census of Agriculture, indicate a real property valuation of approximately \$50,000,000. To this must be added the value of non-movable personal property of which an estimate obtained from the same sources indicates a total of about \$25,000,000. Combined there is a total of some \$75,000,000 of non-removable values in Cache County. From this must be deducted the volume of mortgages owned by persons residing outside of Cache County (details shown below), approximately \$20,000,000. This leaves a net worth for the county of approximately \$55,000,000.

The county population as shown by the Church figures has been nearly static since 1920 when the Census figures showed 26,992. Dividing this population figure into the net property figure indicates an average per capita net worth of approximately \$2,000.

Adopting the theories of invisible items of trade to the

Cache County emigration, one may assume that when a person moves from Cache County on the average he will take his \$2,000 of property with him in the form of a draft on deposits by Cache County banks in the cities to which he has migrated, deposits which were created by the export from the County of its products. This will reduce the buying capacity of the County by \$2,000 and increase the buying capacity of the city \$2,000, a net differential in favor of the city of \$4,000. This is certainly a potent cause for rural and urban economic equality—a cause which was not operative until the days of the Industrial Revolution with its increase of bank facilities.

Like "invisible" items in international trade, such a factor cannot be definitely measured and therefore statistically proved, but based upon generally accepted assumptions in the theories of international trade the deductions seem reasonable. There seems to be no other way to explain the *greater* increase of mortgages in Cache County.

Of course, that the migrating young people are worth the average of \$2,000 is manifestly a false assumption. The property in Cache County as in other regions is owned by the adults who remain. But when the old people die, their children who have migrated in former years receive their shares.

The predominating inheritance custom of the United States is equal division of all property among all children. In a region where real property constitutes nearly all of the inheritance, and what little personal property there is may be moved only with great loss of value, equal division of all property means substantially equal division of real property. The connection between rural and urban economic inequality, the inheritance customs and mortgage-banking facilities of the United States, is evident though not absolutely measurable statistically.

In passing it is interesting to note that Margaret Sanger states that the world birth control movement started in rural France as a direct result of and in immediate answer to the promulgation of the Napoleonic inheritance laws which compelled equal division of real property among all children. The time-connection with Malthus and Ricardo

with their theories of population and relationship of banks to economic inequality is also interesting.

The last step in the study of local conditions in Cache County was to determine the proportion of this drainage of purchasing power compared with the total County income which could be used to purchase goods and services from outside areas, as well as to pay these inheritance-emigration demands. The total sales of all goods and services of the County to outside areas in 1928 was approximately \$7,000,000.

To determine the amount of net purchasing power there was next deducted the amount which must be paid for interest on existing mortgages owed to outside parties. A study of all mortgages and releases since 1910 was made on the assumption that over this period differences in the filing of mortgages and releases would compensate each other, that the difference for the period would measure the total net new mortgages filed in that period, and that the trend would be quite accurately indicated. The portion which is held by outside parties could not be measured, but dependence was placed upon estimates by responsible mortgage loan bankers.

This study of mortgages showed that a total of nearly \$20,000,000 of mortgages in excess of releases have been filed in Cache County since 1910. As they were increasing at the rate of \$500,000 per year in 1910, and as land values were rather low before the advent of the sugar beet factory in 1903, a total of \$20,000,000 of net new mortgages since 1910 would indicate a total of about \$25,000,000 outstanding in 1928. Reliable estimates indicate that easily four-fifths or \$20,000,000 of these mortgages are owed to persons who reside outside of Cache County. After the deduction of their commissions by local mortgage bankers these outside parties receive annually 6 per cent interest.

From these studies there is indicated a net annual interest charge of \$1,200,000 which must be deducted from the nearly \$7,000,000 of County income. One must deduct also a charge of \$1,000,000 as the average annual drainage resulting from emigration (\$2,000 for each of 500 emigrants),

and there is left only \$4,800,000, or about two-thirds of the original purchasing power of the County.

The local significance of this mortgage trend is evident. Starting with about \$500,000 of net annual increase of mortgages twenty years ago, the mortgage rate has steadily increased until now about \$1,000,000 of net new mortgages are added each year. The 1925 Census indicated that mortgages on owner-operated farms amounted to 41.6 per cent of their total value. That a net annual increase of \$1,000,000 of new mortgages can continue indefinitely in a community in which real property is worth about \$50,000,000, of which 41.6 per cent was already mortgaged as long ago as 1925, is manifestly impossible. Speculations as to the possible consequences were not a part of this study, but each may decide as he pleases.

For Cache County this study would indicate that there is a relationship of the flow of population to the problem of rural and urban economic inequality, operating through inheritance customs and mortgage-banking facilities. Its nature as an "invisible" item in inter-community trade renders exact measurement very nearly impossible. The extension of this conclusion to the problem as it affects the entire nation is not justified on the basis of this study alone.

Neither do the results of this study justify the claim that emigration is the sole cause of the existence of mortgages in Cache County. Only the excess of emigration from Cache County is advanced as an explanation of the greater increase of mortgages in that area as compared with other areas, there being no other apparent explanation for this greater increase and this explanation being in harmony with theories which are generally assumed as applying to similar situations in international trade. But if this excess emigration is influential in causing this excess of mortgages, one may assume that the same cause is an important factor in the entire volume of mortgages.

In view of the findings in Cache County, Utah, a tentative extension is justified as a hypothesis for future study. The net movement from farms to cities in the United States has been continuous throughout our history. Since

1922 it has averaged 782,000 per year. In 1925 the owner-operated farms were mortgaged to the extent of 41.9 per cent of their value which would indicate a mortgage indebtedness of \$21,000,000,000 against a total of \$57,000,000,000, the value of all farm property.* This would leave a net equity of \$36,000,000,000, or about \$1,200 per capita for the 29,000,000 persons living on farms in 1925. On the assumption that each emigrant takes this equity with him on the average, this is an annual reduction of rural purchasing power of nearly \$1,000,000,000 in favor of the cities, or a net differential of buying power of nearly \$2,000,000,000 in favor of the cities. In the face of such drainage of purchasing power, current proposals for farm relief seem pitifully inadequate.

Particularly unfortunate would seem to be any measures for farm relief which tend to raise farm land values. Such measures merely increase the drainage of purchasing power which results from emigration. The cheapening of credit, the improvement of marketing facilities, the reduction of costs of production by improvements of science, the lowering of immigration barriers, the raising of tariffs for products which are on an import basis, the reduction of acreage and production so as to force an import basis for the major agricultural products, or export debentures or subsidies—all such remedies merely increase the purchasing-power drainage which results from emigration.

For example, if products are produced at a net increase of annual profit of \$10 per acre, a prevailing interest rate of 8 per cent would indicate an increase to a new sale value

* This estimate of \$21,000,000,000 of mortgage indebtedness is more than double usual estimates, but the author feels justified in extending to all farms the percentage of mortgage indebtedness which the Census found true of owner-operated farms, as furnishing a conservative basis for estimating the drainage of annual productive capacity from our farms which results from the off-the-farm ownership of property rights.

It is reasonable to estimate that non-owner-operated farms are as heavily mortgaged as are owner-operated farms, except those farms now owned by former mortgage owners who have foreclosed. In the latter case the mortgages have dropped out of sight, but the proportion of off-the-farm claims on the annual productivity has been increased rather than decreased.

Also, farms which are cash-rented must send away a larger proportion of their annual product than is true of mortgaged farms, because of the larger element of investment owned by off-the-farm persons. Share-rented farms must send off still a larger portion to cover the additional risk element. And manager-operated farms, if successful, must send off a still larger portion to cover an element of profit for the investors.

Because of these factors it is believed that 41.9%, or \$21,000,000,000, will be found to be a low estimate of "landed indebtedness" though as "mortgage indebtedness" the term is rather loosely used.

for the land at 100/8ths of \$10 or \$125 per acre. Emigration takes this value out either at once if the emigrant owns the property in his own name, or the emigration does so at the death of the parents of the emigrants when they gain title by inheritance. In the latter case, prior to the death of the parents the increase of \$10 per year may remain in the farming community to increase purchasing power by that amount. There is thus an increase of standards of living in the first generation.

If this increase of annual profit is sufficient to cause the young people to remain on the farm, this causes a decrease in the size of the farms, and an increase in land values resulting from this increased competition for the land. When the children of this increased number of families arrive at maturity the problem of emigration is again present, increased however by the fact that there are more children to emigrate, the land values per capita are greater, and standards of living are higher. Thus the issue is not solved but merely deferred to a subsequent generation at which time the difficulty of solution is intensified.

In any event ultimately the increase of land values must be transferred as mortgages or by the immediate reduction of annual purchasing power. If the transfer is by mortgage, then interest at the prevailing rate, say 8 per cent as employed in the second preceding paragraph, must demand \$10 per year on the new \$125 per acre value. Or another way of putting it, if in Cache County there is an increase of net value per capita from \$2,000 to \$3,000 this will cause the annual purchasing-power drainage which results from emigration to increase from 500 times \$2,000 or \$1,000,000, to 500 times \$3,000 or \$1,500,000. If this drainage is deferred by mortgaging, then interest on this increase must reduce the annual purchasing power of the community by an amount approximating the increase in net annual profit of production.

No gain comes by such a process in the farming community. On the other hand, the existence of the fixed indebtedness of \$125 per acre increases its troubles in event of a downward swing of net profits. Inflation of land values is easy, but deflation is difficult if the increased values have

passed into the hands of persons residing outside of the farming community.

To the extent that a tentative generalization may be justified by the Cache County study, we may conclude:

If in a community there is a continuing population pressure which results in emigration, and if in that community real property values constitute a major portion of the wealth, then each emigrant will carry his property rights with him as an order upon the productive capacity of the community, since real property must remain.

This transfer of property rights, transfers to the community into which the emigrants go the purchasing power of the productive capacity of the community of origin, thereby reducing the portion available for the purchase of productive capital or the raising of relative standards of living of the community of origin.

If this emigration is sufficiently strong as to demand a substantial portion of the community's productive capacity, then economic inequality is inevitable and will continue so long as the emigration continues. Through the efforts of the community to offset this drainage by increasing the mortgage indebtedness, the resulting interest charges mount and the unfavorable effects are cumulative.

In an era of good bank facilities and equal inheritance for all children, a remedy for rural and urban economic inequality must include among other factors:

- a. Reduction in population pressure to at least *status quo*.
- b. Cessation of activities which tend to raise the price of farm land.

Criticism of this tentative generalization may be stated thus:

Emigration reduces the competition among those remaining and the real wages per capita for the latter may be improved, provided other factors remain unchanged. So far as Cache County is concerned this criticism is inapplicable because the excessive birth rate causes a maintenance of the population in spite of the emigration. Hence, competition among those who remain is not reduced.

For the United States as a whole, however, this criticism is at least partly justified by the fact that births and farmward migration have not maintained the farming population and there is therefore a definite decrease in competition among those remaining. This has been one factor in the decrease in farm land values, a decrease which has reduced fixed costs of farming and perhaps permitted an increase in real wages per capita for those remaining. Thus, an increase in per capita real wages may be a compensatory factor which partly offsets the loss of purchasing-power which results from the emigration. For Cache County this compensatory factor is insufficient to offset a drainage of one-third of the annual net production of purchasing-power as judged by the steady increase of mortgage indebtedness. An extension of the above tentative generalization to the United States as a whole must await a study of this compensatory factor and its proportion to the total purchasing-power of the farming community and particularly that portion which is annually drained off by emigration.

The writer requests that the principle be kept in mind and not the exact numerical deductions—like the Malthusian theories to which this principle is related, subsequent studies may vitiate the mathematical formulæ employed, though the principle itself may be correct.

In closing, it should be noted that these conclusions are more than the mere trite statement that emigration affects the sociological status of a community adversely. The adverse economic effects have not, so far as the writer knows, heretofore been suggested. On the contrary emigration has been praised as a remedy for farm depression, entirely overlooking the more fundamental necessity of stopping the flow at the source.

CHINESE RURAL ECONOMY

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This article is a brief résumé of a series of studies made during the past eight years of farm economy in seventeen localities in seven provinces of China¹, primarily for the purpose of training Chinese students in methods of collecting information on rural economics and of making available to them and to others knowledge of agricultural conditions in China.

A total farm area of 21,000 acres was included in the survey, with a capital investment of \$2,600,000², and of 17,000 persons. To the vast expanse of China and to the vaster numbers of her population, these figures must of necessity seem small, but they have this value: the data were collected by persons who were trained and who were fitted by peculiar circumstances of location to obtain reliable information, and the studies covered a field fairly typical of a much larger one. In the absence of other and more widespread data these, therefore, have their importance.

The areas studied were typical of North and East Central China, although the conditions in these regions differ a good deal in climate, soil, and topography. In North China one finds the prolonged dry seasons which leave the land almost without rainfall ten months of the year. July and August have two-thirds of the entire annual rainfall. These excessive rains produce disastrous floods. Rainfall is much more evenly distributed in East Central China and this region is fairly free from the famines which besiege North China. Both regions lack adequate means of transportation, however, and this is one of the chief obstacles to a successful agriculture in China. Good roads alone could do much to prevent famine in some places.

¹ *Studies in Chinese Rural Economy*, by John Lossing Buck, published in U.S.A. by the University of Chicago Press, Chicago, 1930, and published in China by the Commercial Press, Shanghai, 1930.

² All currency amounts are in gold, or United States currency, at a rate of \$1.893.

The average farm in either region is, to the western farmer's thinking, appallingly small, measuring only a little over five acres. The field system is that of the open field with the plots usually non-contiguous. The farmhouse, moreover, is most frequently not near the land. Farmers in China live clustered in little villages whence they go out to their fields, and the amount of time wasted in going to the fields would be a serious problem to the western farmer.

The type of farmhouse differs very much in the two regions. In North China the houses are smaller and are usually made of tamped earth and are covered with thatch, while in East Central China they are larger and made of brick and have a tile roof. But certain conditions are common to both; there is little attempt at any beautification or even at the comfort of home, and the living rooms are often the granaries where the crops are stored when they are harvested and sometimes where even the animals are housed. The dooryard is often the threshing floor, and poor sanitation, the proximity of pigpens and privies to the wells, is almost universal.

A study of the limited farm area and of the uncomfortable housing of the average Chinese farmer leads one to the query of how large his farm business is. There is no wholly satisfactory yardstick by which to measure it, but when several factors are taken together, a fairly accurate result is found. Since farms are so small, the crop area is necessarily small. But crop area in itself is an inadequate measure, for small as it is in China, it is still much greater than in Japan. The number of days of labor on the farm is a possible measure and in these two regions this was found to be, taking all family and hired labor into consideration, only 194 working days of ten hours each a year. Animal work units as well are low in number, for animals are idle much of the time and many farmers do not own animals at all but depend on borrowing from richer neighbors, or only own on shares with other farmers. Much of the labor done by men might be done by animals.

Measured by capital invested, the farm business is small. The average total capital invested is only \$934, and is lower

by one-fourth in North China than in East Central China. Three-fourths of this investment is in land and after that the highest proportion is in buildings. Very little is in livestock or in farm implements, partly because there is no animal industry such as in the United States, and partly because there is no labor performed by power other than human or animal.

Farm receipts averaged only \$199 per farm, with a difference of \$147 in North China and \$257 in East Central China. About two-fifths of these receipts were from grains and two-fifths in produce, also mostly grain, consumed by the farm family. Livestock was less than five per cent of the whole and tubers less than 3.4 per cent. In no locality was livestock ten per cent of the total receipts; this is very different from the United States, where livestock produces at least a third of the receipts on the average farm.

But if receipts are low, so also are expenses. The average farm expenses were only \$72 per farm and were about two and a half times greater in East Central than in North China. Contrary to the general opinion that labor in China is cheap, hired labor is the Chinese farmer's highest item of expense. It went to as high a proportion of the total as \$47 a farm, although a better distribution of labor or the introduction of labor-saving machinery might help to reduce this item.

Taxes are high, since the Chinese farmer receives few benefits in return. The average cost of these taxes is an average of \$0.56 per acre of farm area, \$0.29 in North China, and \$0.87 in East Central China. This may be compared with \$0.314 per acre in the United States in 1913-14, and of \$0.709 in 1921-22. Fertilizer averaged about four per cent of all the Chinese farmer's expenses.

With small receipts and comparatively small expenses, profits might be expected to be correspondingly modest. The average family earnings for the year on the average farm, after house rent was deducted, were \$147, and were about twice as great in East Central as in North China. On a per capita basis, it was found that the earnings were only \$2.30 a month and at that were 1.9 greater in East Central than in North China. After all expenses were subtracted

from receipts, the amount of money the average farm family had to live on, aside from raw material for clothing and rent supplied from the farm, was \$73 a year. Nearly a half of the farmers, however, had some source of income other than farming, but even so, the average amount of this income was only \$19 a year. This small farm business, evident from low figures everywhere, means small profits for the farmer and a quality of living determined by a small scale business.

With the evidence of the extremely small size of the farm business, the next step was to find out what size of farm business did in reality prove to be the most profitable. The farms were divided into five groups of graded size, and the profits were then measured by such standards as farm labor earnings, operator's labor earnings, family earnings, labor returns, net profits per crop hectare, and other like measures, in order to see what relation the size of farm had to each of these factors. It was found without exception that on the larger farms the profits were higher and labor efficiency greater than on the smaller farms. A farmer on a large farm works with nearly twice as much efficiency as he does on a small one, and this applies to animal as well as to human labor.

The relation of the size of the farm to crop yields is also interesting. It has been thought that smaller farms must have proportionally higher yields because of the more intensive care given to crops. But data do not prove this point. Crop yields in both regions were in favor of the larger farm. On the larger farm, moreover, less capital investment, in both land and equipment, was found to be required. But even the largest size-group farms studied in these two regions was yet too small for constant returns to begin to operate. In other words, the Chinese farmer on a farm considerably above the average in his region has still a farm too small to be economically profitable.

The natural question which follows is: why are the farms so universally small? The answer is: an over-supply of farmers. There are not a sufficient number of industries developed as yet in China to draw the surplus of men off the land, consequently each succeeding generation the land

is divided and sub-divided until it is now in plots too small for the best economic unit. It is one of most irrefutable proofs of the over-population of the country.

There are, however, some possible remedies for the situation. The amount of cultivated land can be increased by certain definite policies, such as reclamation of land now too dry or too wet or used for graves. Industries, if encouraged by a stable government, would help. More intensive farming methods would increase yields. Some suitable means of giving farm credit would be of real use, and equally important is the problem of transportation. The Chinese farmer in some parts is farming mountain sides that should never have been shorn of their forests. The timber is worth little because it cannot be shipped out, but the land must be wrongly used for farming because food cannot be shipped in and yet must be had at all costs. None of these remedies will give more than temporary amelioration, however, unless some means is found to check the growth of population.

With the Chinese farmers doomed then, by their very numbers, to wrest their living from an amount of land too small to support them adequately, it is interesting to find how many of them at least own the land which they work. Over three-fourths of the farmers in North China are owners, but less than one-half in East Central China. There seems to be no apparent difference in size of farms owned by operators and those only partly owned or wholly tenant. A study of the labor earnings on the three types of farms shows rather astonishingly that the owner earns less than either the part owner or the tenant. Apparently from a business standpoint it pays in China to be a tenant farmer rather than an owner. This conclusion must be modified, however, when one considers that after all, the real advantage is the owner's because he saves a yearly payment which is about equal to interest on investment in land and buildings, cost of taxes, upkeep of the farm, and landlord's profit. Farm labor earnings also show an advantage to the tenant, and generally it can be stated that if the tenant were able to farm as well as he does now with the supervision given by many landlords, he would really be better off fi-

nancially than the owner operator, although family earnings are higher on the owner operated farms. This does not mean, however, that tenants deservedly have a lower income than owners. In China a large proportion of the land is inherited, and it is very difficult for the young farmer who does not inherit land to come into the owner class, although as the data show in many cases, he works harder and farms better than the owner farmer. Tenants in most regions cultivate the same land for life, and this land may even pass from generation to generation. In at least one region there is serious objection to changing tenants; for witness the proverb, "Every time a tenant moves, three are made poor, the landlord, the tenant, and the land."

As to what rent the tenant should pay for his land, it is evident from the data that no general rule can be laid down, because in some places landlords are actually not receiving a proper interest on their investment, while in others tenants are paying much too high rents. From an estimate based on dividing expenses in proportion to receipts, however, rents should, to be fair, be reduced over one-fifth the present rate.

One of the most interesting aspects of the study is an investigation into the cropping systems which the Chinese farmer has learned to follow from centuries of custom and experience. It was found that there are several marked differences between the cropping systems of China and the West. In China there is a far greater amount of double cropping, averaging about fifty per cent of the total crop area. Nearly all of these crops were planted after the winter crops, but in certain parts of East Central China two rice crops were harvested in one season. The double cropping is made possible by the long growing season and by the use of crops that mature before the autumn frosts.

A second difference is that in China crops are grown primarily for their grain, fiber, or leaf products, because the Chinese farmer has no animal industry (in the western sense) and crops are raised primarily for direct human utilization. The by-products, such as stalks and straw, are used for fuel, fodder for labor animals, building, or for kindred purposes.

A third difference is that in China the crops must provide fuel as well as food, not only for the country population but for the city as well. The result is that soil suffers in some degree, because less organic matter is returned to the land than would be if all stalk and straw did not have to be carefully harvested and if more of this material were fed to animals and used as manure. The need for producing fuel throws a heavy burden on the Chinese farm.

The cropping systems themselves are very elastic. Sometimes when wheat or rice is the chief cash crop, these are planted year after year until the land ceases to give a return, and then, in the case of wheat, millet or grain sorghum is introduced, both of these being well-tilled and manured crops. Crop rotations are a definite part of the cropping systems, these varying, of course, with the localities. The cultivated crops include wheat, barley, and rapeseed, which are cultivated at least once in North China and two or three times in East Central China. Kaoliang, or grain sorghum, corn, sweet and Irish potatoes are usually cultivated more than the cereals, with the exception of rice.

Legumes, winter and summer, or second crop, are found everywhere. Peas are often planted with wheat, as are broad beans also in East Central China, although either may be used as a single crop. In the last region these legume crops are sometimes turned under as green manure, but not in North China where the climate is too dry for green manure.

The cropping systems of North China show far greater diversification than those of East Central China, because more kinds of crops can be grown on the upland soils of the north than on the low rice lands. North China farmers also like to be as self-sufficient as possible, feeling that this reduces the cost of living and is more convenient. The diversification, of course, lessens risk from crop failure, distributes income over a larger part of the year, and gives a better labor distribution.

Most of the cropping systems of both regions, except in the rice-fields, contain the essentials of a rotation system: a shallow rooted crop, a cultivated crop, and a leguminous crop. In all of the localities grain farming was the pre-

dominant type, and wheat and rice covered the greatest areas. Ninety-one per cent of the farmers in North China and sixty-seven per cent in East Central China grow wheat, while in the latter region ninety-two per cent grow rice. Wheat in China has a very wide geographical distribution since climatic conditions generally are favorable and it is one of the few crops that can stand the winters.

In general, it seems true that the Chinese farmer is growing the crops best suited to his locality although often he fails to make an adaptation as quickly as the situation demands. For instance, in one section near Nanking, Kiangsu, the low hills are admirably suited to the growing of peanuts, sweet potatoes, and fruits, all of which are insufficient for the local market; yet with a few exceptions farmers are not growing these crops, although the soil and topography seem ideal for them.

Of all crops, 54 per cent are sold as cash crops, a little over two-fifths of the total in North China and a little over three-fifths in East Central China. This shows a fairly commercialized agriculture, contrary to common belief, and shows also that the farmer has requirements which need ready cash. Very few crops are raised entirely for sale, however, although some, such as rapeseed and sesame, which are commercially valuable for their oils, are almost entirely sold.

Crop yields in China, except for rice, are not as high as observers of Chinese agriculture have been led to believe in the past. Wheat yields are approximately the same as in the United States where agriculture is commonly thought to be more extensive than in China. Corn yields less than one-half in China what it does in the United States, although sweet potatoes yield two or eight times as much in China. In summarizing the data on yields, it is safe to say that the agriculture of China is not as intensive as has been supposed and that yields can be increased by the use of better seed, more fertilizer, and the utilization of labor now idle.

The keeping of livestock has a definite relation to crop production and the maintenance of soil fertility. If animals are kept mainly for draft purposes, it is evident not only that the people eat little meat, except where fish is

plentiful, but it is also probable that animal manure is not one of the chief sources of soil fertility. These draft animals are used largely for labor. In the north the oxen and in the East Central China the buffalo are the most common, with donkeys coming third, hogs and chickens next, and ducks and geese in lesser numbers. Some sheep are raised in Shansi. All animals except oxen are found more frequently on the East Central China farms, and of all animals a little more than two-thirds are used for draft purposes.

The farms in both regions are very lightly stocked, only 2.00 animal units per hectare, on the average. This means in relation to the soil that a very limited amount of fertilizer is from animals. In both regions, however, human feces are used, and if this is taken into consideration the fertilization is about 3,344 pounds annually per crop acre. But there is no conservation of organic matter such as crop stalks and residue. All this material is rigidly gleaned from the fields, and taking this into consideration, it is evident that the soil on the whole is insufficiently fertilized for high yields. In the absence of transportation and credit facilities, this constitutes a real problem to the Chinese farmer.

Since animals are kept primarily for draft purposes, their relation to labor on the farm is pertinent. Labor was expended in the greatest amount on the two chief crops, rice and wheat, although the wheat in East Central China takes twice as much labor as it does in North China because the soil of the rice fields is stiff clay. Cotton, one of the most important of all crops, takes the next highest amount of labor, and then hemp, vegetables, squash, tobacco, indigo, and melons. The man labor requirements per acre are, of course, much larger in China than in the United States where so much machinery is used. Winter wheat, for instance, in the latter requires only 11 hours per acre in comparison to 243 in China, and cotton in the United States requires 117 hours per acre of man labor and in China 656 hours. Animal labor comparisons for the two countries show the same tendencies, although in somewhat less extreme measure.

The average farm in the two regions shows an average equivalent of two working men. If the total number of working days is considered, it is evident that each laborer is idle for several months of every year. That is, only about one-sixth of each year, taking into consideration rainy days and holidays, is directly utilized in productive enterprises. Of the labor on the farm, two-fifths is performed by members of the family, one-fifth by hired labor, and another two-fifths, approximately, by the operator himself. Of this hired and family labor, a little over one-fifth is by women, 31.6 in East Central China; and only 11.8 in North China, where foot-binding is still prevalent. Children do about 6.1 of the hired and family labor.

Animal labor on the farm is evidently not well planned, for while a man performs an average of about 119 ten-hour days a year on productive enterprises, an animal works only about 63 ten-hour days a year, and it is a common sight to see a man toiling in the sun while his beast lies resting in the shade of a tree.

Another point in relation to labor is its distribution over the year. In most of the places this distribution could be better planned, for the months of sowing and harvest are too heavy, and during the winter months, except at Wutai, Shansi, where some sheep are raised, there is almost a total lack of work for man and beast. This lack of work during the winter limits the income, since expense goes on for food and shelter and there is no productive income. The problem of winter work is, however, nowhere an easy one. Supplementary work, either at home or away, is one possible solution. In Su Hsien, Anhweo, for instance, the women and children make winter shoes of felt from cows' hair. In some places it is a regular practice for the young men of the family to go to the cities to find work. It is a question whether China will not find it well to develop industries on a scale small enough to be managed in the home rather than in the large centers one finds in the West.

The cost of labor in China, while wages are low, is on the whole astonishingly high. The average annual wage paid to a laborer in North China is \$22 and in East Central China \$42, but these wages make up a total of 63.5 of

the total farm expenses, exclusive of the operator's own labor.

The whole problem of labor on the Chinese farm is a most significant one, because of its high cost, its uneven distribution, and its inefficiency from the point of view of accomplishment. And yet, taking these all into consideration, it is doubtful whether the Chinese farmer can afford to substitute machinery for human labor. Human labor is the great natural resource of China, and capital in the form of money is at a premium. Farmers pawn their tools, their clothes, anything they can collect, to raise a little money. Labor is much more abundant with them than land or credit, and when one considers not only the investment cost of machinery but also its operating costs, and above all, the poor roads which make impossible in many cases the transportation of machinery from one scattered plot of land to another, it seems inadvisable to suggest the innovation of western farm machinery to the Chinese farmer. The real problem on his farm is not primarily how to reduce labor, but how to diversify it, and how to enlarge the farm business by more intensive farming so as to increase rather than to decrease the number of working days in the year.

This abundance of labor is only one of the manifestations of the greatest of China's problems, that of the number of her people. The density of population in a country has a very definite relation to farm practice, for on the number of people per unit of land depends the answer to the question whether standards of living are high or low. Labor is scarce or abundant, and bandits are few or many. In China the farm family is of the large family type; that is, there is not only the marriage group of the male head, his wife and his children, living under one roof, but also relatives of the male head. Sixty-four per cent of the families in the two regions were of this type and 42.5 of the population were relatives of the male head. A third of these relatives were daughters-in-law, and mothers and fathers were next highest in proportion. The average age of marriage of the male head was 19.7 years and of their wives, 17.9 years. The length of a generation is approximately one-fifth of a century. The number of persons in the average farm family

was 5.7 as compared with 4.4 in the United States and 5.19 in Japan for the same number of families. Size of family bears a clear relation to size of farm, increasing in numbers as the farm increases in size.

The age distribution in population for the two regions in China, compared with a similar distribution in such countries as Japan, Germany, France, and Sweden, shows a much smaller number of persons for the years under two and over sixty, and a larger number of persons for the years between than in any other country except France. Probably the population of the farm groups studied in China is between the progressive and stationary types. If this is true, then the population is increasing.

Sex distribution varies in China according to four periods: the first having a predominance of males, the second of females, the third about equal, and the fourth with females predominating. The average ratio of males to females is 105.7. The differences in sex distribution can be explained without difficulty. In the first period male children received better care than the female; in the second many of the young males emigrated, about 3.7 of the population, less than one per cent of which are females; the third period is that of child birth for women and probably the incidence of death is high; and the last period the natural longevity of women over men is true in China also.

The density of population in North China is 621 per square mile and in East Central China is 839. These figures may be compared with 78 in Denmark, with 1,238 in Japan, and with 49 in the United States. Denmark and the United States have a relatively sparse population because of the use of more animal products which require considerable land, and because in both countries there is a definite unwillingness to accept a lower standard of living. Chinese farmers themselves are constantly referring to the increase of population and from ancient times the whole question of the number of people to the unit of land has been held to be an important one, in view of the grave question of how to feed this increasing multitude.

In China much of the food consumed by the farm family is, as has been noted, produced on the farm and the question

of the dietary therefore, depends a great deal on the type of crops grown. Of the food consumed by the farm families of the two regions 83.3 per cent was furnished by the farm and the rest was purchased. The amount of food purchased depends somewhat on the crop year; if it is good, less food is needed from the outside. Distance of the home from the market may also be a reason for buying less of such foods as fruits, meats, beancurd, and the things seldom raised on the farm. In some cases where good cash crops are produced these will be sold and inferior food bought and eaten. But the bulk of the food comes from the farm, and such foods as fruit and sugar are not considered essential parts of the diet. Vegetables, especially in North China, are used in a very limited quantity, the farmer there giving as his reason that he does not know how to grow them. The probable reason is a disinclination to master the methods of vegetable growing.

Nine-tenths of the food energy consumed by the families of the two regions came from seeds and their products and eight per cent from roots, mostly sweet potatoes. Beans come next in importance and, after these, vegetable oils. Because of the extremely large percentage of energy from seed why the Chinese farmer can subsist on such on such a small amount of land, for his utilization of the land is thus direct rather than through the medium of animals as it is in the United States. The average number of calories consumed per adult-male unit in China is 3,461, and this may be compared to the western standard of 3,400 calories.

There is very little variation in the dietaries of the localities; a few products are consumed in large quantities and there is a general insufficiency of vitamins, calcium, and certain protein radicals. Dietaries are chiefly seasonal in nature and in North China especially show a hand-to-mouth existence with a hard race against starvation in years of bad crops. The whole problem of fuel, too, is closely related to that of food, because the scarcity of grass and stalks in many places makes the proper cooking of food a difficulty.

But beyond the matters of food subsistence there are other necessities of life and in any study of farm manage-

ment it is desirable to discover, in so far as it is possible, the quality of living which the farm business gives the family. The cost of living is first to be found, although this does not in itself constitute a measure of the standard of living.

In the families studied the value per adult-male unit of all goods consumed showed an average expenditure of \$26.45 divided as follows: food, \$17.95; fuel, \$2.25; clothing, \$1.61; rent, \$1.01, and all other items, \$3.53. On a per capita basis, this means an average value of goods consumed annually of only \$20.31. The average value per household for the four physical necessities for a year was \$72.00 for food, \$13.38 for fuel and light, \$9.14 for clothing, and \$5.98 for rent. All other items amounted to \$20.12 per household. It is obvious that the higher the proportion the four necessities bear to the total income the lower the standard of living netted. The average proportion for North China was 86.4 per cent and for East Central China 79.7 per cent.

The expenditure of \$120.61 per household of 5.7 of the families studied in China may be compared with \$1,598 per family of 4.8 in the United States, with \$506 in Japan per household, and with \$1,263 in Denmark. The ratio between the Chinese family and that of the United States is 1 to 16. But this does not necessarily mean that the difference is wholly in the standard of living. The Chinese family gets its chief source of food from a cheaper one than the United States does and of course price levels must also be considered. The fact remains, however, that when all things have been considered, the Chinese farmer must be satisfied with far less than his fellow farmer in the United States.

Of things other than the four necessities, education is one that may be mentioned. Of the present generation of farmers less than one-half have ever attended school and of the generation of their children seventy-five per cent are not in any school. This is less important than it seems for such schools as are available in these country districts are for the most part of the old classical type which require only the memorizing of ancient books and have therefore little practical value for the farmer in his daily life.

Besides education, little money is expended on recrea-

tion, chiefly at the time of the New Year holiday and consisting of tea-drinking and gambling. The cost of recreation per family for those who reported it was \$1.01; and this may be compared with \$22.50 for the farm family in the United States.

In general, one observes from the data a standard of living appreciably higher in East Central China than in North China. But even with this, the standards of the two regions, when compared with those of other countries, are too low. The Chinese farmer has to spend too much of his income on the bare essentials and has even then nothing but food unvarying and lacking in nutriment, clothing of the cheapest sort, and a home which is nothing more than a shelter. The chief cause of this low standard is without doubt the small size of his farm and the density of the population which makes it necessary, and all remedies will be of little but temporary value unless something is done to check the growth of the population.

Nor will mere economic relief bring to any certain degree the farmer's improvement in standard of living. More money may simply mean more gambling or some such useless expenditure unless the burden of ignorance is removed from the people. Poor communications have kept the rural people isolated; their inadequate education has kept them ignorant; and there has been but little to open and enlarge their minds to those things which pertain to socialization, and which are necessary to the happy and fruitful human life.

Nevertheless, even after taking all into consideration, this pressure of population and the somewhat primitive methods of farming in China, no great immediate change seems possible. The Chinese farmer has by the trial and error method arrived at many sound and practicable conclusions for his situation. He does need help, however, in adjusting his cropping systems to the now changing demands of markets and prices, to dietary needs, and, in some cases, even to soil and climatic conditions. And, in order to increase his yields, he needs help in procuring better seeds, in control of insects and pests, and in more intensive methods of fertilization and cultivation. Improved transportation and credit

and better marketing facilities would also do much to aid the Chinese farmer. Besides these he lacks a vital and satisfying mental and social life. The future of Chinese agriculture depends for its development upon the fulfillment of these needs of the farmer.

In closing this article it seems pertinent to question the worth of such a study as this, involving as it has an immense amount of labor and no small cost. Of what value is it to those of us who live in the East and in the West to know these details of farm life in China? In the first place, little is known of the actual conditions of rural life in China. Generalizations have been made from casual observations, but the accuracy of these generalizations can only be tested by the meticulous use of schedules and figures applied to and gathered from the individual farms. Such data are essential not only in conveying the truth about China to westerners, but to the Chinese as well. China has been a country without reliable statistics and it is to her advantage to obtain them, not only from the point of view of taking her place in world statistics, but also for the important reason of self-knowledge before there can be self-improvement. This study was begun with the idea of collecting accurate data on Chinese farming conditions to teach Chinese students, and not only data, but methods of collecting such information, so that these students might in the future discover for themselves the facts of their own country.

But beyond this there is yet other value in having made this study, slight as it must appear in the future when others more profound and more useful will be made. In the age which is upon us the question of international relations is an outstanding one; if we are to live at peace with each other as nations in the world, it must be upon a basis of mutual understanding and cooperation. China has not hesitated to study and to appreciate the West and to adopt as quickly as she has been able many of the western methods of thought and education, particularly in science. But the West has not so readily reciprocated, partly because of self-absorption, and partly because of the difficulty of making such studies. Yet if there is to be a real understanding between nations it must be mutual. We cannot know a people

until we know accurately their conditions of life; and research, the collection and analysis of facts, is a constructive contribution to international welfare in so far as it promotes this understanding.

Research, therefore, into the life of the farmers of China is in this way constructive international work. Since so large a proportion of China's people are farmers, it is fitting that the primary emphasis on understanding China should be laid on an understanding of her rural life. If we are to estimate and appreciate the agriculture of China we must know about her soils, her crops, her livestock, her conditions of land ownership, in short, about all those conditions which affect the lives of millions of China's people and doom them to ignorance and poverty or lead them to affluence and freedom. Such study is difficult because of the wide diversity of the conditions in various parts of the country, but not the less necessary.

If the study will contribute, therefore, in any measure to this two-fold purpose, the furnishing of information to Chinese students regarding some phases of the agriculture of their own country, and the adding to that gradually accumulating body of accurate knowledge about China, a country so rich in every kind of human experience, for the benefit of those of international mind, it will have performed the duty for which it was made.

THE THIRD-YEAR AWARDS OF GRADUATE FELLOWSHIPS IN AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

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The third year's competition for awards of fellowships provided by the Social Science Research Council attracted a large number of applicants, though not quite as many as in the two preceding years. A noticeable feature was the large and strong representation from the field of rural sociology.

Conditions were more favorable this year to assembling the members of the Committee, and all except one were available for the first meeting; and a full attendance was secured at the second. In a careful preliminary consideration, about one-half the applicants were discarded and the remainder continued for further investigation. Having carefully studied the relative merits of this preferred group, the Committee met for a second time on March 12 and selected a list of twenty-one to be awarded fellowships under the \$30,000 automatically available. Three additional names were selected as urgent cases for appointment provided the Social Science Research Council would authorize the expenditure of more than \$30,000 during the current year. In addition to these twenty-four names, five others were added as alternates in case of resignation by any of the regular appointees.

On the representations made by our Committee, the Council authorized a budget of \$34,000 for the coming year, and twenty-four appointments, carrying total stipends of \$32,895, were made. Furthermore, Mr. L. W. Hauter, one of last year's fellows, was granted an extension of his fellowship through the summer session. The list of appointees

¹ Chairman of the Committee.

and alternates, together with their present connections and the institutions which they expect to attend, is as follows:

<i>Name</i>	<i>Present Connection</i>	<i>University to be Attended</i>
Allbaugh, Leland G.....	Iowa State College	Columbia or Harvard University
Atkins, S. W.....	Experiment Station, University of Tennessee	Cornell University
Beck, Philip G.....	Ohio State University	University of Chicago
Beers, Howard W.....	Cornell University	University of Chicago
Card, Dana G.....	University of Kentucky	Cornell University
Crawford, George L.....	United States Bureau of Agricultural Economics	Columbia University
Garman, Cameron.....	Alabama Polytechnic Institute	Columbia and Cornell Universities
Hamilton, Charles H.....	Virginia Agricultural Experiment Station	Columbia University
Hammerberg, Donald O..	Connecticut Agricultural College	University of Wisconsin
Johansen, John Peter...	University of Wisconsin	University of Wisconsin
Kelso, Maurice M.....	Connecticut Agricultural College	University of Wisconsin
Kifer, Russell S.....	United States Bureau of Agricultural Economics	Columbia University
Loomis, Charles P.....	North Carolina State College	University of Minnesota
Mumford, D. Curtis....	United States Bureau of Agricultural Economics.	Columbia or Harvard University
Murray, William G.....	Iowa State College	University of Minnesota
Negaard, O. A.....	University of Wyoming	Harvard University
Newell, Sterling R.....	United States Bureau of Agricultural Economics	Columbia University
Nickell, Paulena.....	University of Minnesota	University of Minnesota
Peterson, Arthur G.....	United States Bureau of Agricultural Economics	Columbia University
Summers, Thomas H.....	Colorado Agricultural College	University of California or Minnesota
Smith, T. Lynn.....	University of Minnesota	Harvard University
Underwood, Floy L.....	Cornell University	Cornell University
Whetten, Nathan L.....	University of Minnesota	University of Minnesota

Wiecking, Ernst H.....	United States Bureau of Agricultural Econom- ics	Harvard University
<i>Alternates</i>		
Cole, Ralph H.....	Nebraska Agricultural College	Harvard University
Dorn, Harold F.....	Cornell University	University of Wisconsin
Finn, William G.....	University of Kentucky	Harvard University
Hampson, Chester C.....	Experiment Station, State College of Washington	Columbia University
Taylor, Edward A.....	University of Minnesota	Harvard University

The regular appointee list includes seven workers in the field of rural sociology and seventeen in agricultural economics. It includes one woman, as was the case last year, although Miss Foley—last year's appointee—was unable, on account of ill health, to take advantage of her fellowship. For the first time the list includes one renewal. Mr. Lynn T. Smith, having made a brilliant record at the University of Minnesota last year, has been awarded a second-year fellowship to continue his work at Harvard University.

While in general the procedure of this year has followed lines laid down in the preceding years, one slight change may be noted. Last year the Committee found so large a group of men of apparently equal merit that it attempted to stretch its funds to cover the largest possible number of appointments. In so doing, the size of the stipend was reduced somewhat below the level of the first-year appointments. In the present awards, there has been a return to the basis of payments of the first year, with stipends ranging from a minimum of \$900 to a maximum of \$2,100.

The reports received by the Committee from the institutions attended by holders of fellowships during the first two years, supplemented by personal contacts with the men during and after their year of fellowship work, convinces us that this fund is accomplishing in a very large way the purposes for which it was intended. It seems clear that competition for appointments will continue to be keen in the two remaining years for which the fund is available. Those interested should bear in mind that application blanks are sent out on December 1 and must be filed by February 1. At least half a dozen applications could not be considered this year because of the lateness in filing.

NOTES¹

AN ANALYSIS OF MONTHLY PRICES OF EGGS

The marked seasonal variation in egg prices from the low level in the spring up to the high point in the late fall and then back down again, is well known. But it is not so well known that the prices of eggs are lower in proportion to the volume of receipts from December through April than they are from May through October, when receipts are decreasing. One factor causing this difference between the two periods is that eggs are being taken off the market during the months of March through July and placed in storage, from which they are withdrawn and placed on the market during the fall and winter months. Another factor is that dealers are not under as much pressure to sell when receipts are decreasing seasonally and prices are rising, as they are when receipts are increasing and prices are declining seasonally. Another striking thing about monthly egg prices is that they react differently to the same proportional change in receipts, each month in the year. During June, July, and August, past and current prices apparently determine the proportion of the production which is shipped to the large cities. During these summer months there is a positive relationship between price and the volume of receipts at the principal markets. However, even during these three months variations in the volume of receipts do cause minor changes in prices.

These conditions make it advisable to study each month as a distinct problem in itself, though related to the months preceding and following. It appears that different groups of factors are important in determining monthly prices during each of the seasons, Spring, Summer, Fall, and Winter, and within any particular season the importance of each factor in the group is usually somewhat different during each of the months.

The price of Pacific Coast Extras in New York was used in an analysis made by the writer. The study was restricted to the period 1922 through 1929 because changes in the relative importance of the factors determining egg prices make it inadvisable to employ a longer period. Studying each month separately allowed the use of only eight observations in each correlation analysis. The method of graphic curvilinear correlation that has been best described by L. H. Bean of the Bureau of Agricultural Economics,² was used because it makes more obvious the nature of the net relationships between the various factors and price when a small number of observations are used in an analysis than does the method based on mathematical formulæ. This method also requires very much less time to carry through.

The crop year for eggs begins in March. At the beginning of this month, the warehouses are practically empty, except when the spring is unusually early and a quantity of eggs is put into storage the last week or so in February. Dur-

¹ These notes are assembled in each issue of the Journal by Professor John D. Black, of Harvard University. See p. 330 of the April, 1929, Journal for the announcement concerning these notes.

² See Journal of Farm Economics, July, 1929, for an illustration.

ing the three spring months of March, April, and May, production is very greatly in excess of consumption. During this period about 75 per cent of the peak holdings in the warehouses the first of August are accumulated. Prices during these months are very largely determined by the total receipts arriving at the large markets of the country, and by the demand for these eggs by consumers for immediate consumption, and by storage operators to hold until fall when production and receipts are much less than consumption. The general level of prices is a minor influence in comparison with these supply and demand factors. While the eggs in the storage warehouses are part of the physical supply at this time, they generally are not considered as part of the supply in the market because prices rarely advance sufficiently above the purchase price before August to permit these eggs in storage to be sold at a profit.

The influence of consumer demand in the spring upon egg prices is apparently measured fairly satisfactorily by the Bureau of Labor Statistics All-Commodity Wholesale Price Index. This index was used for this purpose on the theory that the level of wholesale prices indicates business activity and prosperity, with which consumer demand tends to correspond. The demand for storage purposes appears to be determined by the relative profits from storage operations the previous two years and by the outlook for the current year as indicated by the volume of eggs in storage, which seems to be considered a measure of the probable volume of refrigerator eggs which will have to be worked into consumption during the fall and winter. The influence of the storage profits declines, and the influence of storage holdings increases, as the season progresses.

For the summer months of June, July, and August, the volume of eggs in storage, storage profits, and consumer demand appear to be the important factors determining the level of prices. As the volume of eggs in storage increases from March through July, this factor seems to exert more influence upon the judgment of dealers as to the price which they can afford to pay for eggs to store until fall. When consumer demand is strong and storage operators are also active, prices are bid unusually high, as occurred in 1925 and in 1929. Prices were very low in the summer of 1927 when both types of demand were dull. In August, receipts decline in volume to less than current consumption and once more become an important influence. However, the quality of the eggs in the warehouses is generally still very good, so that when particularly hot weather adversely affects the quality of the current receipts, storage eggs are readily substituted. The volume of eggs in storage, therefore, is influential at this time in determining the price at which the fresh eggs can be sold.

Production is much less than consumption during the fall months of September, October, and November. Receipts of fresh eggs are therefore the most important factor determining the price of this product. Eggs from the Pacific Coast constitute about 40 per cent of the receipts at New York during October and November, and almost as large a proportion of the arrivals at the Four Markets—Boston, Chicago, New York, and Philadelphia. The pullets hatched the previous spring in the Middle West generally do not commence to lay until December, though with the development of commercial hatcheries, more chicks are being hatched in the early spring, and this is swelling the receipts of fresh eggs in November. But the Pacific Coast eggs are the chief supply of the fancy white eggs for which there is a strong demand in New

York. A certain portion of this demand is that of the upper income groups which are not influenced very much by price. But when the receipts of Pacific Coast eggs exceed the volume of this inelastic section of the demand, the price has to drop to the point where enough price-sensitive consumers will absorb the volume coming to market. The extent of this price drop is apparently influenced by local prosperity, which seems to be measured fairly well by an Index of New York Purchasing Power constructed from factory pay rolls and the value of building permits in New York City. Storage holdings affect the prices of the better grades of fresh eggs to a certain extent by attracting a portion of the demand away from fresh eggs as the price differential between the two types of product widens with the decrease in the receipts of fresh eggs.

As the winter progresses through December, January, and February, more of the pullets in the Middle West come into production and swell the volume of receipts of fresh eggs at the important markets. Weather conditions cause important fluctuations in the volume of these fresh receipts. Thus storms curtail production and receipts and raise prices. The size of the storage reserve determines in a large measure the extent of the price rise when receipts are thus reduced. As the winter progresses and production and receipts grow larger, the storms do not as a rule reduce the receipts to such an extent as earlier. However, when the storage reserve is very small and unusual storms occur throughout the producing regions, on the Pacific Coast as well as in the Middle West, the reduction in the volume of receipts produces an exceptional rise in price, as in 1929. With these wide fluctuations in the supply during the winter, the comparatively small variations in consumer demand, as measured by the All-Commodity Price Index, are a relatively minor factor in determining egg prices.

This analysis of the factors determining the monthly prices of Pacific Coast eggs throws light on the forces influencing the prices of other types of eggs, because the fundamental forces in the egg market affect the various classes of the product in much the same way. It supplies many of the basic facts about the relationships between the various factors and price which it is necessary to know in working out methods of forecasting weekly, monthly, and spring and fall seasonal average prices, in which there is a growing interest, particularly on the part of cooperative marketing associations.

Gordon H. Ward

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PRORATING CREAMERY EXPENSES

There can be no question that creameries need to adopt some system of prorating the various expenses that will give a more uniform expense rate per unit of product throughout the year than is obtained by the usual accounting methods. The principal difficulty results from the fact that many expense items, such as depreciation, interest, taxes, insurance, and in most cases, salaries,

are treated in the usual accounting method as functions of time, while in reality the true economic costs are more closely related to volume of business. This problem is particularly important in the larger creameries, which are not located in the better dairy sections and therefore have a greater seasonal variation in volume. A careful check-up of the method followed in the better managed of the creameries shows that by following the usual accounting method, they over-pay or lose money in the months of January, February, March, and April; then show profits or under-pay in May, June, July, and August; then show losses for the remaining months of the year. In reality, of course, these book losses or profits are merely the result of poor accounting methods. Instead of attempting to follow accounting methods, which will show the true over- or under-payment throughout the year, it seems for practical reasons advisable to follow the usual accounting method, but always with the interpretation that the book losses or over-payments for the first part of the year will be made up by profit or under-payments during the flush of the season. With the present caliber of creamery management, this method is probably preferable from the record-keeping viewpoint over a method which might attempt to show the true position of the organization from month to month regarding over- and under-payment.

The handling of expense deductions in the semi-monthly or monthly pools varies widely among the creameries in Iowa—from those which very carefully calculate, according to the usual accounting method, the expenses for each period and deduct these before determining their butterfat price, to the other extreme, which follows the market for butter without any particular calculation of monthly expenses. In reality, it frequently happens that those following the latter procedure, provided they come out at the end of the year even with the board or slightly ahead, are following a sounder economic basis of expense allocation than those which are using the detailed accounting method.

This, of course, may appear to be a peculiar statement coming from one engaged, like the writer at the present time, in assisting a large number of creameries in following the usual accounting method. But, in a program of education in business practices, one must start at a point where one can get cooperation and then gradually point out the necessity of changes in methods. Nor is the above statement to be taken to mean that the creameries with which the writer is working are handling their pooling methods on a less sound basis than those on the outside, for such is far from the case. In addition to this, the accounting work being done with these creameries is only a small part of the program for improving their business practices, and while their pooling methods are as yet not what they should be, their financial records and position have been greatly improved.

When one undertakes to work out a flat-rate system of prorating creamery expenses, one encounters two really distinct problems. First, there is the problem of determining the rate to use, which in many instances must have seasonal differentials; and second, there is the problem of interpreting on the books the true financial position of the creamery from month to month within the year. A flat rate was worked out for one creamery after analyzing its records for a period of three years; and in this case the method has worked

very satisfactorily. In another instance in a large creamery, depreciation from month to month was handled in such a way as to give a uniform rate per pound of butter throughout the year. The manager of the creamery in this latter instance was wholly in accord with the method followed; but to handle labor and other salaries in such a manner that the monthly payments, which are uniform throughout the year, would not be met during the period of short volume, seemed to be quite a different problem. In other words, since this expense was actually covered by checks, it required too much stretch of the imagination to see that the same principle was involved here as with depreciation.

Budd A. Holt

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VARIATIONS IN LINEAR MULTIPLE CORRELATION RESULTS
CAUSED BY A FEW UNUSUAL OR OFF-TYPE FARMS IN
A FARM ORGANIZATION STUDY

With the growing use of multiple correlation as a tool in analyzing farm organization data there is danger that the effect which unusual or off-type farms may exercise on results may be forgotten.¹ The purpose of this discussion is to present results from a farm organization study in North Alabama which furnish an excellent example of different conclusions that might have been drawn when even so few as two unusual farms were included or excluded from the analysis.

In the course of analyzing 119 cotton farms for some of the factors determining labor income and the relative importance of these factors, a multiple correlation coefficient of .825 was obtained; this coefficient expressed the combined relationship to labor income of acres of cotton, yield of lint cotton per acre, outside sources of income, and receipts from poultry and poultry products. Let it be assumed for the purpose of this discussion that there was causal relationship between the factors considered in this analysis and labor income. Let it be assumed further that the per cent determination of each factor measured the portion of total squared variability in labor income attributable to that factor, or that per cent determination indicated the relative importance of the various factors in determining labor income. If these assumptions are made the per cent determination which accompanied the high correlation coefficient showed outside sources of income (X_2) to be twice as important as acres of cotton (X_3), and acres of cotton to be twice as important as yield of lint cotton per acre (X_4) in determining labor income. These results did not coincide with common knowledge of the area, for it is a specialized high-yielding cotton section, which would lead one to believe that outside income is less important than the cotton enterprise.

It was realized that correlation results were less valid where there were extreme departures from normal in the distribution of any of the factors.² After examining the data with this in mind nine farms were eliminated from

¹ Ezekiel, Modzeai, Factors Affecting Farmers' Earnings in Southeastern Pennsylvania, U.S.D.A. Bulletin No. 1400, pp. 46-49, April, 1926.

² Mills, F. C., Statistical Methods, pp. 406-408, 1924

the analysis, five because of high outside sources of income, one because of large cotton acreage, and three because of high receipts from sales of poultry and poultry products. With these omitted the results shown in column 6 of the following table were obtained. The per cent determinations were in strik-

DIFFERENT LINEAR MULTIPLE CORRELATION RESULTS
Obtained by Eliminating Farms with Extreme Fluctuations in Some of the Factors Considered

Column No.	1	2	3	4	5	6
No. of Farms	119	117	115	113	111	110
	Original	Two farms with highest outside sources of income omitted	Two more with largest cotton acreage omitted	Two more with highest poultry receipts omitted	Two more with highest outside sources of income omitted	Five omitted because of high outside income, one because of large cotton acreage, three because of high poultry receipts
$R_{1.2345}$	.825	.739	.687	.700	.671	.659
Per cent determination:						
X_2	38.03	16.36	21.28	22.55	16.17	11.39
X_3	19.11	24.03	10.10	9.38	10.10	12.87
X_4	9.78	13.17	14.50	15.75	16.89	17.34
X_5	1.22	1.04	1.38	1.38	1.80	1.82
Total	68.14	54.60	47.26	49.06	44.96	43.42
Coefficients of net regression:						
$b_{12.345}$	1.17	1.24	1.25	1.23	1.32	1.21
$b_{13.245}$	18.86	18.78	15.84	15.07	15.08	14.43
$b_{14.235}$	2.35	2.33	2.20	2.21	2.19	2.20
$b_{15.234}$	.18	.13	.15	.22	.21	.22
Per cent change in labor income with 20 per cent change in each indicated factor when the other indicated factors were held constant:						
X_2	7.15	6.24	6.79	6.79	6.41	5.62
X_3	20.53	22.65	19.36	18.51	19.44	19.33
X_4	42.10	46.48	46.99	47.36	49.37	50.32
X_5	1.31	1.74	2.07	2.54	2.63	2.73

X_1 —Labor income in dollars.

X_2 —Outside sources of income in dollars.

X_3 —Acres of cotton on farm.

X_4 —Average yield of lint cotton per acre in pounds.

X_5 —Receipts from sale of poultry and poultry products in dollars.

ing contrast to the original results shown in column 1. With only 110 farms included in the analysis, yield of lint cotton per acre (X_4) appeared most important in determining labor income on these farms, with acres of cotton (X_3) second, and outside sources of income (X_2) third. The correlation coefficient was reduced from .825 to .659 by omitting the nine farms. The per cent determination of X_2 was reduced from 38 to 11, of X_3 from 19 to 13, and X_4 was raised from 10 to 17. The coefficients of net regression, however, and the per cent change in labor income with a given per cent change in each of the other factors when all but the one varied were held constant, remained fairly stable.

Since the per cent determinations changed so radically with the elimination

of nine farms, possible determinations that would have been obtained had only part of the nine farms been omitted from the analysis were desired. Only two farms with highest outside sources of income were first omitted and the results shown in column 2 were obtained. The per cent determination in these results showed acres of cotton (X_2) to be the most important factor of those considered in determining labor income with outside sources of income (X_1) second, and yield of lint (X_4) third. The coefficients of net regression and the per cent change in labor income with a given per cent change in each of the factors considered again remained quite stable.

In addition to the two farms already omitted, two others with the largest cotton acreage were omitted, and the results shown in column 3 were obtained. In these results the per cent determination showed outside sources of income (X_1) most important, yield of lint cotton (X_4) second, and acres of cotton (X_2) third in accounting for the total squared variability in labor income. Again the coefficients of net regression and the per cent changes in labor income with a given per cent change in each of the factors considered remained fairly stable.

In addition to the four farms already omitted, two more with highest receipts from poultry and poultry products were omitted, and the results shown in column 4. These results were changed very little from those obtained when only four farms were omitted.

In addition to the six farms, two more with highest outside sources of income were omitted, and the results are shown in column 5. Again the per cent determination changed more than either the coefficients of net regression or the per cent change in labor income with a given per cent change in each of the factors considered.

These results bring out the danger of placing too much confidence in a high correlation coefficient and the per cent determinations obtained in a linear multiple correlation analysis until the original data have been carefully examined. They illustrate the possibility of the inclusion of so few as two unusual farms in a group of 100, completely changing the relative importance of the factors considered as revealed by per cent determination. In the results presented above each of three of the four independent variables considered, if casual relationship could be assumed, were shown accounting for the largest portion of total squared variability in the dependent variable by omitting in succession pairs of unusual farms. On the other hand, in these results the coefficients of net regression changed very little when unusual farms were omitted.

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EDITOR'S NOTE: The results of Mr. Garman's work emphasize the necessity of carefully defining the universe of study before the collection of data is begun and of carefully editing and examining these data before final analysis is made. In addition, it supports tentative conclusions reached by Ezekiel, Working, and others concerning the use of coefficients of determination in correlation analysis. Attention should also be called to the fact that the variables used represent a very confused set of interrelationships, which is significant in

interpreting the value and meaning of the coefficients of correlation and determination. It is also important to consider carefully the qualitative relationships involved in a problem before choosing the variables in a correlation analysis.

THE FARM BOARD'S PROPOSAL FOR STABILIZING THE CALIFORNIA GRAPE INDUSTRY

The Federal Farm Board's plan for stabilizing the California grape industry will be of more than passing interest to many agricultural economists both because of the importance of the grape industry and because it is an industry program sponsored by the Farm Board. Grapes rank second only to apples among all fruit shipments originating in the United States. Oranges rank third, watermelons fourth, and peaches fifth. The importance of grapes to California is apparent when it is realized that California grape shipments exceed those of any other California fruit and vegetable. Yet that is only half of the story. In addition to the shipments of fresh grapes, California produces an equal quantity of grapes which are dried and sold as raisins. Of the 2,000,000 tons of grapes annually produced in California approximately 700,000 tons are juice grapes, 300,000 tons are table grapes, and 1,000,000 tons are raisin grapes. Consequently, grapes in the San Joaquin Valley of California mean much the same thing as corn means in Iowa, or wheat in Kansas.

According to the Farm Board's estimate, the 2,000,000 tons of grapes produced is nearly 300,000 tons too many, and it is around this 300,000 ton surplus that the Board's plan centers. In other words, the plan is primarily a surplus control plan rather than a marketing plan.

Simply stated, the plan proposes that each grower pay a fee of \$1.50 per ton to purchase the 300,000 tons surplus and remove it from the regular channels of trade. Obviously, the plan is not quite so simple as this; but the removal of the surplus is the goal of the scheme.

To make the plan effective will require the joint action of growers, cooperative marketing agencies, and independent shippers and packers. The first requirement is that 85 per cent of the growers take part in the plan. The second is that the Sun-Maid Raisin Growers' Association, the California Fruit Exchange, the California Vineyardists' Association, and the independent shippers and packers lend their support. The third is that a Control Board be established that will handle and dispose of the surplus.

The way in which independent shippers and packers are to participate in the Farm Board's program is of interest. The independent shippers of juice and table grapes are to continue to handle the shipments of members of the California Vineyardists' Association as they have in the past. The independent raisin packers are to draw their supplies from a common pool known as a "sweat box pool" created by the industry program. The Sun-Maid Raisin Growers' Association is to purchase its supplies for processing from the same

pool. This arrangement was made because, in the words of Mr. Teague, the member of the Farm Board who announced the plan, "California commercial shippers and packers for many years have been an important factor in the distribution of raisins and fresh grapes."

Further details of the Farm Board's plan contemplate the payment of the bonded and bank indebtedness of the Sun-Maid Raisin Growers' Association. This organization, which at one time handled approximately 85 per cent of the output of the raisin industry, has lost volume but has continued to carry the surplus. As a result it became financially involved and would have been forced to liquidate had not the Farm Board in 1929 lent its support. It was felt by the Farm Board that the failure of the Sun-Maid cooperative would have lost to the raisin industry valuable outlets and the well-known Sun-Maid trade marks. Consequently, the plan contemplates the payment of the Sun-Maid debts by deducting \$3.50 a ton, in addition to operating expenses, which sum over a period of years will cancel the Sun-Maid obligations.

The Control Board set up by the plan is to dispose of the surplus. With funds lent by the Farm Board, it will purchase the by-products plants owned by Fruit Industries, Inc., a corporation which has developed important outlets for grape products. The capacity of these plants is to be expanded and additional facilities now owned by the Sun-Maid Association will be equipped to handle by-products. With the fee of \$1.50 per ton collected from 85 per cent of the grape growers, the Control Board is to purchase the surplus, and either develop by-products or allow the grapes to remain on the vines.

The effectiveness of the plan will depend upon its reception by California grape growers. Mr. C. C. Teague, in his announcement of the plan to 4,000 grape growers at Fresno, California, said, "If a campaign is put on for a sign-up, it must be yours. The responsibility of putting it over and making it effective must lie with you. The campaign should be a voluntary one, participated in by all of your people who are interested in the prosperity of the grape industry. The campaign should be conducted upon an educational basis and no coercion should be used."

Thus far the proposal has been favorably received by the majority of the growers. Those in attendance at the announcement meeting endorsed it and several agencies have indicated their willingness to participate. Although the sign-up campaign has not been completed (June 9) educational meetings are being held and growers are reported to be signing contracts.

If the growers adopt the program, it should mean order in an industry that has been in a state of chaos for several years. The final test of the plan will, however, depend upon the action of the growers in their production operations. If production is increased either through additional acreage or better care of the vineyards now in production, failure will result ultimately. If the Control Board can hold prices at a level that will not stimulate production, the program may succeed. No doubt this program will receive considerable attention by other groups. It is a definite recognition of a surplus problem.

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PROBLEMS IN COOPERATIVE MARKETING OF TURKEYS¹

The increasing use of the incubator in hatching eggs has lowered the cost per poult to turkey producers by increasing the production of eggs per hen. In addition to this, new management methods have greatly reduced death losses. The result has been a decrease in the costs of rearing turkeys. These two improvements have also removed a large part of the instability from turkey production, and have increased the importance of turkeys as a cash crop to a large number of producers. These developments have seemed to promote interest in turkey marketing, which in turn has led to the development of co-operative organization for marketing purposes.

The cooperative marketing of turkeys in the South has largely taken the form of collective bargaining. Carlots are assembled from a number of producers and sold alive to operators of poultry dressing plants or at some live poultry market. In Western Texas there are two groups of producers which have provided themselves with the necessary equipment to dress and pack their own birds. By doing this they have extended their market, since a larger number of buyers compete for dressed turkeys than for live birds.

In the Middle West or Corn Belt, cooperative marketing of turkeys has been undertaken as a sideline by associations handling other commodities. In the East, turkeys are sold to small dealers who operate locally or who send out trucks for their supplies.

Cooperative turkey marketing has reached its greatest development in the Rocky Mountain region, on the West Coast, and in the territory of the Land O' Lakes Creameries. The creameries have engaged in turkey marketing only a relatively short time, but their resources have made it possible for them to progress very rapidly.

Movement of the turkey crop is very seasonal. Prices are quoted at New York on fresh turkeys dressed from November to March. Producers usually follow the practice of selling all turkeys which are sufficiently matured for Thanksgiving. The remainder are matured if possible for Christmas. Those not salable at this time are marketed later in the winter and are used largely to increase storage stocks.

The actual seasonality of the turkey movement is difficult to establish because dressed poultry receipts at the markets are not separated from other receipts. On the assumption, however, that live turkey receipts at New York City furnish a usable indication of the seasonality of this movement, some information is available. The Yearbook of the U. S. Department of Agriculture shows that live turkeys in 1929 were 1.6 per cent of total live poultry receipts, or more than 167 carloads. Of these, about 112 carloads were received in November and 39 carloads in December. Thus 151 carloads, or over 90 per cent of total receipts, were marketed within the two months in which the Thanksgiving and Christmas holidays occur. Such scattered information as is available from the records of cooperative associations indicates that this is a conservative estimate of the seasonality of the turkey movement.

The concentration of the heavy turkey movement within two months is the

¹The author of this note is employed by an organization which does not allow its employees to claim authorship of their contributions.

greatest problem in the development of organizations for marketing turkeys. Cooperative organizations handling this product have operated only seasonally, and have remained dormant throughout the remainder of the year; or some organization has handled the turkeys as a sideline. In the few instances where turkeys have been handled by a large farmers' organization marketing a similar product, such as poultry and eggs, the results have been more satisfactory, although even in these organizations improvement is possible. Managers are prone to be concerned principally with problems at hand and the seasonal sideline enterprise is naturally neglected.

The cooperative turkey marketing organizations which remain periodically dormant are made up usually of isolated groups of producers. Management is in the hands of local producers whose contact with the market is negligible, whose marketing experience is limited to the assembly and sale of the local turkey crop each year, and whose channels of information are meager. Such information as is available comes from correspondence with other managers who are similarly situated. In addition to these handicaps, the local turkey marketing associations compete with each other for the outlets which exist for their product. Under these conditions it is not surprising that turkey marketing associations sell their best grade of product at prices which vary considerably in any given year. The association must sell, for the marketing season is short, and the management is faced with a date beyond which it holds its turkeys only at the risk of being late at the holiday market. The buyer, on the other hand, has many sources of supply and is therefore not faced with the necessity of supplying his wants immediately. Because large turkey buyers in the country are few, the buyer has a competitive advantage. Because of his superior resources and contacts, he is better informed. Also, the buyers have more time in which to assemble supplies than the original seller has in finding an outlet.

The conditions under which turkeys are marketed point to the need of more strength within the cooperative turkey marketing organizations. Probably this can be accomplished best by a strong federation of the existing associations. Because of the short operating period, care must be exercised to keep the personnel of such a federation small. A large volume of business per employee needs to be done in order to keep overhead costs from being an excessive burden. By using the existing machinery for movement of the physical product, the overhead organization need consist of little more than a planning board with sufficient authority to make itself effective. Such an organization could do much to equalize the bargaining advantages of sellers and buyers. First, a permanent manager would be in a position to exchange production and marketing information by contact with public officials and cooperative associations in other important regions. This would bring the cooperatives to the market better equipped to bargain with the buyers. Second, by concentrating all sales at one point, the sellers' position would be much stronger, since more experience and information would be available. In consequence, there would be less exploitation of local managers and less large variations in prices received for similar grades of turkeys. Finally, by accumulating capital for reserves, the overhead organization could be prepared to reject unsatisfactory offers at the producers' market, and when advisable, carry the product to the wholesale

markets in the larger consuming areas where buyers are more numerous and competition more keen.

When the immediate inequalities of the present system were in hand, the overhead organization could turn its energies to other important problems which confront the turkey industry. Producers' problems could be investigated to improve quality, control production, and develop more profitable flock management practices. Trade marks might be developed and advertised to gain consumers' confidence. Consumptive demand may be stimulated at other than holiday seasons. Analysis of sales policies may be made to determine at what price and in what volume it is advisable to withdraw the product from the market for storage. In short, a large number of turkey producers, in combination, may engage talent to do many things which will safeguard and perpetuate their industry.

MILLING WHEAT IN BOND

The principle of encouraging the export of products made wholly or partly from imported materials was incorporated in the first tariff act of the United States government, in the form of a drawback provision. This act of 1789 provided that 99 per cent of the duties paid on imported merchandise, with a few exceptions, would be returned if exported within one year. It also provided for a drawback on the duty paid on imported salt used in the salting and packing of fish or the preparation of provisions when these foods were exported.¹

The practice of manufacturing in bond was not definitely recognized in tariff legislation until a much later date. The tariff act of October 1, 1890, definitely provided for the smelting of ores in bonded mills without the payment of duty on the ore, provided the metals obtained were exported. The manufacturer, however, was required to pay all expenses incident to custom office supervision.

The tariff act of July 4, 1897, changed the wording of the previous act to include any imported materials. The flour milling industry has taken advantage of both the drawback and manufacturing-in-bond provisions. During the tariff hearings in 1929 before the Ways and Means Committee of the House of Representatives and the Finance Committee of the Senate, both the drawback on flour and the milling in bond of flour from Canadian wheat were vigorously opposed by some representatives of the milling trade and by some representatives of farm organizations.

As long as the United States produced all the wheat of various qualities needed for home consumption and for the export trade, there was slight occasion for the mills in the United States to operate under the manufacturing-in-bond provisions of the tariff acts. The tariff on wheat was not effective and prices in Canada for comparable grades were little different from those in the United States, taking into account location and transportation costs. Both countries were exporting high-protein wheat or flour to the various importing

¹ United States Tariff Act 1789, sections 3 and 4.

countries of the world. About 1922, the spring wheat mills of Minneapolis and the winter wheat mills of the Southwest found that there was a scarcity in the United States of the high-protein wheat which they needed to make the kind of flour that their customers had been taught to demand. The mills began bidding for the high-protein wheat, and premiums were paid for it according to its per cent of protein, which had the effect of bringing in such wheat from Canada, where there was an abundance of it, over the tariff barriers. The American mills then faced the problem of meeting the competition of the Canadian mills in foreign markets, with these Canadian mills securing duty-free all the high-protein wheat they required. By taking advantage of the manufacturing-in-bond provisions of the United States tariff act, they could meet this tariff difficulty and make flour from Canadian wheat and more nearly retain their world markets in competition with Canadian mills. They also erected more plants at Buffalo (New York), where they could secure Canadian wheat just as cheaply as the Canadian mills just across the border.

The mills engaged in "milling-in-bond" must furnish a bond, in amount satisfactory to the United States Treasury Department, guaranteeing compliance with the stringent rules and regulations covering manufacturing-in-bond in general and milling-in-bond in particular. These mills must further furnish bond for twice the amount of the duty on each lot of imported wheat, that is, eighty-four cents on each bushel. This bond is held by the government until the flour made from the imported wheat is exported and the duty of $7\frac{1}{2}$ per cent ad valorem paid on the bran, shorts, and other mill by-products which are sold on the domestic market.

That milling-in-bond does not take away the market for domestic wheat, is the position taken by the mills which operate under this provision of the tariff act. They hold that wheat milled-in-bond is the kind of wheat that the United States does not always produce in sufficient quantity even to meet home consumptive demands. The imported wheat is similar to the hard winter and hard spring wheat that sells at a premium of from a few cents only some years to as much as twenty or thirty cents and even more in other years. There would be no added demand for domestic wheat if the milling-in-bond provision did not exist, inasmuch as United States mills could not pay the premium for high-protein wheat and sell the flour in competition with Canadian mills. Domestic mills would not buy the low-protein wheats which are now exported to the amount of 150,000,000 to 250,000,000 bushels annually because these wheats will not make the kind of flour that is being made from Canadian wheat. The bonded mills have been able to mix small amounts of domestic wheat with the Canadian wheat, thus creating a market for a quantity of domestic wheat which would not otherwise have been milled in the United States. Thus the bonded mills, according to this point of view, actually strengthen home markets rather than weaken them.

The opposition by farmers and farm organizations to milling-in-bond is built upon one or both of two assumptions. One is that if the milling-in-bond of imported wheat from Canada were not permitted, wheat grown in the United States would be used by the mills instead of that imported. The other is that

in the milling operations for export flour, low-priced and home-grown wheat is substituted for the higher-priced Canadian wheat, and the millers then sell flour from the Canadian wheat on the American market without the payment of the tariff, which has the effect of keeping premiums on high-protein wheat from advancing as high as they otherwise would. The second of these would require chicanery upon the part of the millers and dishonesty or inefficiency upon the part of the government officials entrusted with the administration of the tariff act. There are no facts to indicate such a situation. The law provides that all flour made from wheat milled-in-bond must be exported, and that the flour from any domestic wheat mixed with the imported wheat must likewise all be exported. It cannot be sold in the United States even by the payment of the tariff. United States custom inspectors check in the imported wheat and see that the bills of lading and scale weights are correct. They repeat this operation when the wheat is transferred from boat to bonded warehouse. After the wheat is milled, the bran, shorts, and other by-products are weighed under custom office supervision and the proper duty collected before they are released for domestic consumption. The flour is not only handled by the mill under bond, but the railroads which carry it and the terminal warehouses which handle it at the seaboard are likewise under bond. Inspectors are on duty at all times when mills are in operation, and records of grain taken in must check with the amounts of flour and by-products shipped out.

The view that substitutions of domestic for foreign wheat occur may arise from confusing the drawback with milling-in-bond. Under the drawback provisions, the full duty on imported wheat must actually be paid, and then all or a part of the wheat may be ground in a bonded mill; but 30 per cent of domestic wheat must be mixed with the foreign wheat and all of the flour from this mixture must be exported. Little or no flour has been manufactured and exported under the drawback provision during the last few years. Millers do not wish to be obligated to mix 30 per cent of domestic wheat with the imported wheat since home-grown wheat of required quality is likely to be selling at a premium in the United States. Furthermore, the mills have capital tied up in the duty paid, and must wait at times for months until the wheat is milled and the flour exported before the drawback payment can be obtained from the government. Then only 99 per cent of the duty paid is returned.

It seems evident that if the milling-in-bond arrangement were not in effect, mills in the United States would lose foreign markets for flour made from wheat of the quality imported from Canada, when the price of wheat of this quality is higher in the United States than in Canada. Under the milling-in-bond arrangement, capital is retained in the United States, some employment is provided for labor, and the market for farm products is increased. There is no evidence that it is disadvantageous to industry or the farmer, and there are unquestionably some advantages.

Milling interests in Canada have voiced serious opposition to the milling-in-bond activities of the United States mills and have called upon the Canadian government to pass an export tax on wheat used in this way. They wish to divert the milling of Canadian wheat for the export trade to the Canadian

mills, with a view to building up their home industries and providing labor for their own people. The western Canadian grain producers did not support this movement, as they feared it would reduce the market for their already large surplus of wheat. Canadian milling interests have been pleased with the proposals in the United States to annul the milling-in-bond provision of the tariff act. Their view is aptly expressed in a statement which appeared in one of their milling magazines to this effect: "Canada does not care on what ground the United States repeals its existing provisions as long as it does repeal them."

The export of flour to Cuba by Buffalo mills under the milling-in-bond arrangement has called forth a vigorous protest by some of the mills in the southwestern part of the United States. By treaty with Cuba, products of United States industry or soil may be exported to Cuba at a 20 per cent reduction from the tariff duties levied against other countries. Likewise Cuban products, such as sugar, may be imported into the United States and secure the 20 per cent reduction from the United States import duties. Buffalo mills export to Cuba about 700,000 barrels of flour made largely from hard spring wheat and enjoy the 20 per cent reduction, amounting to about 35 cents a barrel, even if the wheat used is Canadian. Certain mills in the southwestern part of the United States claim that this is unfair to them, in that it takes away a market in Cuba which they once had and would still have if the Buffalo mills did not enjoy the 20 per cent reduction in duty on the high protein flour made from Canadian wheat. The Buffalo millers hold that if it were not for the preferential duty, high-protein flour from the United States would not be exported to Cuba and that the Canadian mills would get the business. They further state that commercial bakeries in Cuba now demand a large amount of high-protein flour made from hard spring and hard winter wheat and will not substitute soft-wheat flour or low-protein flour for it. They state that the bakers desire the high-protein flour because the low-protein flour becomes sticky and rises less satisfactorily in the hot moist Cuban climate. They want what they term a "sleeping" flour, that is, one that does not rise too quickly and does sour so easily. While the Cuban trade uses certain amounts of the soft-wheat and low-protein flours from the south and southwest, they are getting all of this quality of flour that they wish.

United States mills, as already pointed out, cannot pay substantial premiums for high-protein wheat and compete in world markets with Canadian mills. Even under the manufacturing-in-bond provisions of the tariff act now in effect, the United States mills are gradually losing foreign trade in flour. For the period 1925 to 1929 inclusive, the exports of flour had decreased about 2,500,000 barrels annually as compared with the period 1921 to 1924, while Canadian exports have increased several million barrels annually since 1921.² Due to the Cuban preferential tariff, the United States has practically all of the Cuban flour trade, just as the Canadian mills have an advantage in the British West India flour trade through a tariff differential favoring Canada.

² Wheat Studies of the Food Research Institute. Vol. VI, No. 2, p. 98.

³ Bill passed June, 1930.

The tariff bill now before Congress provides that flour made from foreign wheat may not enjoy the Cuban preferential duty, but it does retain the general manufacturing-in-bond provisions. Should this bill pass,³ it remains to be seen whether exports of hard spring wheat flour from the United States to Cuba will decrease. If such a decrease occurs, it will be interesting to note whether it will result in larger exports from the southwestern mills using hard winter wheat, or whether the Canadian mills will secure the trade.

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BOOK REVIEWS

How Great Cities are Fed by W. P. Hedden. Boston, Mass.: D. C. Heath & Company. 1929. 302 p.

This book was written to "trace the revolutionary changes in methods of distributing perishable foodstuffs to our large terminal centers, analyze the types of facilities needed under the new conditions, emphasize the more important elements of city marketing cost, and point out the developments which seem to promise a reduction in the spread between farm and city prices."

In the first chapter the author has presented a vivid picture of the changes that have taken place over a relatively short time in the variety, volume, and sources of perishable foods consumed in New York. The methods of transport, and the importance of terminals and storage facilities are also vividly pictured. The subject matter of the next six chapters is devoted to the physical facilities of terminal markets, and that of the rest of the book, except the last chapter, to the cost of marketing through terminal markets.

In the second chapter the influence exerted by freight rates, tariffs, sanitary regulations, and inspection standards on market areas are described and illustrated. This is followed (Chapter III) by a discussion of the changes wrought on marketing mechanisms by refrigeration, with some prognostication of further changes likely to develop out of recent improvements in mechanical refrigeration and transportation. The importance of transportation services, types of commodities, and the methods of commercial distribution in determining terminal locations constitute the subject-matter of Chapter IV. In this chapter the separate discussion of each important type of commodity, a procedure used throughout the book, proves particularly valuable.

Chapter V is made up of brief but enlightening descriptions of the factors involved in the transportation and terminal handling of perishable food. Topics discussed include shipment through such gateways as Chicago and Potomac yards to New York, the use of humps, hold yards, and ferry boats, unloading, loading, keeping consignees notified, inspection and sale by buyers, pier head cartage delivery, and trucking to jobbing markets. Chapter VI (Who are the Middlemen?) is really an outline put in to complete the picture. Since middlemen and their activities have been discussed so many times the brevity of this discussion is entirely justified—although Mr. Hedden's views on the services of the middlemen described would be appreciated. The requirements of various kinds of city trade as they affect the planning of terminals, are the subject of Chapter VII.

The cost of city marketing is the subject of chapters VIII-XIII. Chapter VIII (An Apple a Day Costs a Lot on the Way) contains, in addition to a general discussion of margin studies, a valuable discussion of the objectives and limitations of such studies. Chapter IX is devoted to an analysis of the costs and profits of city dealers by types of trade, and is concluded with the statement that "Throughout the range of city marketing costs the elements of cartage, spoilage, and wages of salesmen loom prominently. Evidence of

unusual or exorbitant profits to proprietors is difficult to find. Examination of dealers' accounting records suggests that one should next study the conditions surrounding city cartage, the making of retail sales, and the deterioration of produce." In the next three chapters each of these subjects is considered. Chapter XIII concludes and summarizes the discussion of costs. An interesting feature of this chapter is a debate arranged by the author between himself and Warren and Pearson. The question—Resolved, that the farmer's prosperity is dependent upon his getting a particular share of the consumer's dollar—is defended by Warren and Pearson by means of a summary and quotations from their publications and the negative is presented, but not definitely upheld by the author, who states, in conclusion, that "much more extensive data than those now in published form are needed to answer these questions." (p. 243).

The last chapter (XIV) is entitled "Public Control and the Food Supply" and involves a discussion of the ways in which such control is exercised—maintenance of health, maintenance of commercial standards and restraint of fraudulent practices, control of transportation and terminal charges, control of prices and price-fixing combinations, establishment of physical facilities, and a concluding section on the extension of public control.

The informational basis for the book rests largely on studies made by the author and others concerning the marketing of perishables in New York City and its environs, although studies relating to other cities are drawn on to some extent. Most of this information is already familiar to students of marketing, since it is taken from previously published studies, but every student will be helped by having it brought together in this way, and interpreted by one with Mr. Hedden's experience and ability. And the problems discussed and the suggestions offered are, in the main, of general application.

In the reviewer's judgment this study would be an important contribution if it did no more than bring together related material bearing on the problems of city marketing. For familiar materials are here combined in a manner which shows the interrelationships of the physical equipment and commercial operations of city marketing more clearly than it has been done before. But, in addition to this, almost every chapter includes suggestions and conclusions of great interest and value. For example, in Chapter VII (the Interdependence of Terminal Facilities and Trade Organization) we find such sections as Ample Consolidation Space Important, Integrated Distribution Organizations Seek Decentralized Regional Deliveries, Stabilization and Control of Volume Necessary to Direct Shipping, Influence of Terminals on Trading Practices, and in Chapter XII (The Toll of the Garbage Dump) is a section entitled Ordinary Shipping Package Too Large for Metropolitan Retailer. The book is filled with such sections, always brief but decidedly pertinent.

A valuable feature of the whole book is the inclusion where such a scheme is suitable, of sections dealing with the peculiar problems of each type of perishable. The author points out in this connection that "City planners often make a fundamental mistake in thinking of all food stuffs as flowing through the same channels. As a matter of fact, the retail store or market is the only place where the meats, potatoes, butter, milk, poultry, and fruits are brought together, short of the consumer's table. Back of the retail store there are

separate distribution channels and separate processes so varied that the whole-sale marketing and terminal handling of milk may be said to differ as much from that of peaches as the marketing and handling of oil differs from the handling of cotton-piece goods." (p. 53). The author recognizes these differences wherever it is important to do so. In the discussion of the geography of food terminals and food industries, for example, separate sections are devoted to milk, fresh fruits and vegetables, meats and dairy products. Some of the other chapters also include separate discussions of the distinct problems connected with marketing live and dressed poultry.

Many pictures, maps, charts, diagrams, and tables help to illustrate and clarify the text. Thus in Chapter IV there are "photographic" maps, first, of the New York area, as a whole, and then separate maps showing the location of plants, terminals, and warehouses, used in the preparation and marketing of milk, livestock, live poultry, fresh fruits and vegetables, and dairy products.

Fred E. Clark

Northwestern University

The Economics of Branch Banking by Bernhard Ostrolenk. New York: Harper & Brothers. 1930.

The argument of this thought-provoking book is that unit banking has been rendered *passé* by the economic developments of recent years. After reviewing the centralization of industry and the bank failures of the past decade, and discussing recent developments in group banking, the author concludes "that branch banking will give a superior banking service to the small community unattended by present dangers of losses to depositors; that branch banking is the inevitable evolution of banking as it accompanies industrial development; (and) that if branch banking is stifled a sort of deflected form of branch banking in the form of chain banking will develop." Because of the surreptitious character of the holding company and the difficulty of exercising public supervision of group and chain banking systems, the author regards some system of branch banking as best suited to the needs of this country.

Under the unit system of banking, according to the author, industry and business have suffered from inflation of purchasing power based on speculative values in the stock market. ". . . . As the speculative increases in prices of securities permeates the country, production and consumption are speeded up beyond the earning capacity of the country." The most recent example of this danger culminated in 1929 when a supposedly sound industrial structure found itself in an over-expanded condition.

Referring to excessive loans on stock market collateral, which are considered to be largely responsible for the inflation of security values, the author states "The decentralized system of banking . . . in which there is no unifying policy . . . not only makes it profitable that each banker should take advantage of this situation, but there is no incentive for the banker not to take advantage of it." "If we assume the existence of a branch banking system in the United States, . . . that will be connected with industrial productivity throughout the whole country . . . , the chance of inflated speculative activity of the stock

market may be greatly diminished." Furthermore, "It is not improbable that the branch banking system will reorganize investment banking."

Agriculture also has suffered from the unit banking system. Following an analysis of the agricultural situation, in which the industry is described as being over-expanded and inefficiently conducted, the author points out that "The unit banker had aided and abetted this exuberant production and development." He "like the farmer, had a local viewpoint only." "It seems highly improbable that with the development of branch banking . . . American agriculture will continue its economic chauvinism." "There is every hope that . . . branch banking . . . is likely to have a decided influence upon a more orderly production and marketing. . . ."

Bank failures, the author indicates, have been confined almost exclusively to the small institutions serving agriculture. The causes of these failures have been "(1) the flight of profitable business from the small town", owing largely to good roads and the development of chain stores, and "(2) the depression of agriculture." As a result of these conditions the country banks are described as having a very low earning capacity and as having sustained tremendous capital losses. Also, it is pointed out that the agricultural sections of the country have been grossly over-banked. The locally managed and financed banking unit "has got out of step with the march of progress."

There is a great deal of truth in this excellent book. It may fairly be questioned, however, if the author has not exaggerated the extent to which the depression in American agriculture has been, and in the near future is likely to be, due to the improved efficiency of farmers and their increasing use of machinery. Furthermore, the inferences drawn from foreign experience as to the superior management and greater stabilizing effects of branch banking systems are of doubtful validity. Reports from Canada, England and Germany, not to mention other countries, indicate pretty clearly that the agriculture of those countries has not been saved from depression by branch banking.

In one case data have been used in a manner which the reviewer believes to give an inaccurate picture of banking conditions in the agricultural districts. On pages 38, 39, and 40 there is a table which shows the relation of net additions to profits to capital and surplus in national banks. Using these figures as evidence the author states, "Thus Montana, Utah, Idaho, New Mexico, South Dakota, and South Carolina had losses or conspicuously low earnings during the past eight years for their country banks." One would infer from this statement that the earning capacity of banks in these states had been seriously impaired.

Using the same source material as was employed by the author, the reports of the Comptroller of the Currency, the reviewer has prepared the following table which shows for these states the averages for the past eight years not only of net additions to profits but also of current operating net profits and net losses, in relation to capital and surplus.

TABLE 1. CURRENT OPERATING NET PROFITS, NET LOSSES AND
NET ADDITIONS TO PROFIT IN RELATION TO CAPITAL
AND SURPLUS

(Averages from period 1921-1928 inclusive)

Country National Banks in	Current Operating ¹ Net Profits	Net ² Losses	Net additions to Profits
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Montana	11.8	10.1	1.7
Utah	11.9	6.8	5.1
Idaho	12.9	12.8	.1
New Mexico	14.6	13.5	1.1
South Dakota	10.2	8.9	1.3
South Carolina	10.6	6.5	4.1
Entire Group	12.0	9.8	2.2

¹ Exclusive of losses and recoveries on such losses.

² Losses minus recoveries on losses.

On this showing, the poor record of the banks as to net additions to profit seems to have been due to heavy losses rather than to low earning power. If the losses were sustained in the years they were charged off, the author's contention as to low earning capacity is justified. But the reviewer does not

TABLE 2. COMPARISON OF CURRENT OPERATING NET PROFITS,
NET LOSSES AND NET ADDITIONS TO PROFIT IN RELATION TO
CAPITAL AND SURPLUS DURING SEVERAL
PERIODS SINCE 1921

Country National Banks in Mon- tana, Utah, Idaho, New Mexico, Current Operating ¹ South Dakota and South Caro- lina.	Net Profits	Net Losses ²	Net Additions to Profit
<i>Period</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Average of 1921-1924 inc.....	10.3	9.2	1.1
Average of 1925-1926 inc.....	11.6	10.7	.9
Average of 1927-1928 inc.....	15.7	9.9	5.8
1929	18.9	10.2	8.7

¹ Exclusive of losses and recoveries on losses.

² Losses minus recoveries on losses.

believe this was the case, except possibly in South Carolina. It is the reviewer's belief that most of these losses were incurred in the early years of the period, due largely to the decline of agricultural prices, and that if they had been charged off then many if not most of the banks would have had to close. Failures were numerous enough without adding banks which had a reasonable

chance of working out of their difficulties if left alone. The losses, consequently, have been charged to the income of later years, the banks using their income to regain a position of solvency. Certainly this was true of the state of Iowa, of which the reviewer has first hand information. As soon as the losses are retired, it may be expected that net additions to profits will rise to more satisfactory levels.

Through increased current net profits the banks in these states already are showing much improvement in their net additions to profits, although losses charged off remain great. This is shown in Table 2 on preceding page.

All in all, the author's contention that country banking has been threatened seriously by the "flight of profitable business" does not seem to have much warrant.

Notwithstanding some questionable features, "The Economics of Branch Banking" is a timely and stimulating book in which the arguments for branch banking are cleverly arrayed. Many will disagree with the author's conclusions as to the need for and probable efficacy of branch banking, but recent developments lend much support to his belief that the country is faced with a choice of branch banking or a considerable extension of group banking.

Fred L. Garlock

Bureau of Agricultural Economics

Dairy Farming, by Wilber J. Fraser. New York: John Wiley & Sons, 333 p. \$2.50.

During the past fifteen years many organizations, both public and private, have been trying to bring profit to the farm by means of improved marketing. The most gigantic of these schemes is the Federal Farm Board which is now passing through the test period. There is no question but that a consideration of the problems of the market has brought about some valuable results. At every gathering of farmers, farm leaders, and politicians who seek the farmer's vote, the solution of the farm problem is considered to be on the market end.

While all this study and agitation about marketing and farmer organization has been going on, there have been some persons who remained steadfast in their belief that the operation of the farm by the individual farmer and farming practices have something to do with profit in agriculture. These men have realized that in this day science must do its part in helping make the result of labor profitable. They have not been lead away from their research projects by the enthusiasm of the "saviours of agriculture." Their task has been, to say the least, unpopular; but they have gone ahead with the firm belief that efficient production methods were the foundation stones upon which profitable agriculture must be built.

There is, at the University of Illinois, one of these scientists who has been studying the problems of profitable dairying for more than 25 years. His task has been that of trying to aid the farmer who keeps dairy cows to make a better profit and have a more wholesome life. The results of these long years of study have been published recently so that the principles of profitable dairying might be made available to every dairy farmer who really wants to become a better dairyman. The conclusions drawn from the dairy research studies

made by the author of this book are "Profit per cow arises from the difference between the cost of keep and the value of the product." This profit increases when the production per cow increases; when the cost of keep is lower without changing the production of the cow, and third, increasing the price received for product.

Professor Fraser is interested primarily in the first two of these factors. He recognizes, however, that the third is important, but as a scientist in dairy production he has devoted his life to research upon the phases of production. His system in a nut shell is: First, good cows; second, good sires; third, good rations; fourth, good care and housing; fifth, proper care of the products and marketing.

The effort which has been placed upon the marketing end of agriculture is to be commended. It must, however, be so conducted that there will not be a disregard of the economies of agricultural production. It is a hopeful sign that scientists are not being swept away from their paths of duty by the popular appeal. One hesitates to surmise how different our agriculture would be today, if during the past fifteen years, scientists had received the same financial, popular, and political support which has been given to those who proposed to save agriculture through marketing reform.

Professor Fraser has done a very commendable piece of work. His new book "Dairy Farming" should be the handbook of every man who professes to be a dairyman and until dairymen at large are following the sound fundamentals of dairy science as set forth in this book, they should hesitate to complain about lack of profit coming from this type of farming.

John T. Horner

Detroit, Michigan

Marketing Purebred Livestock by M. N. Beeler. New York: Macmillan, 1930. 194 p. \$3.75.

As stated in the preface, this book was written to bring about improvement in the methods and practices of marketing purebred livestock. Back of this purpose is a more fundamental one of encouraging a wider distribution of purebred animals in order to improve the general quality of livestock and thereby increase the efficiency of agriculture and the incomes of livestock producers, both of purebred and market stock.

The handicap under which the purebred livestock business operates is the lack of any organized market, where producers can find a ready market for their animals and where prospective buyers can make their purchases with some assurance of securing dependable breeding stock at reasonable prices. Lacking such a market the producer has one of two alternatives, either private sales or auction sales. If the former method is followed success depends largely upon advertising and salesmanship ability, which may be lacking in men whose abilities as breeders are exceptional. The auction sale is not only expensive in itself, but involves considerable hazards due to weather and other conditions, and has been subject to questionable practices which have brought it into considerable suspicion if not disrepute.

This situation is brought out clearly in Mr. Beeler's book, which is largely

descriptive. With a wide knowledge of the practical aspects of purebred marketing derived from first hand contacts the author discusses the various angles of the business in a way that is both informative and interesting. He has an unusually apt method of supporting his statements or illustrating his points by descriptions of actual experiences or methods of different breeders.

As is to be expected his description and criticisms of prevailing methods is given in much greater detail and in a more convincing manner than are his suggestions for changes or improvements in those methods. In his account of the questionable practices that developed in the purebred business during the boom years prior to the debacle of 1921 he seems to show a particular antipathy toward the activities of the field men, who, while ostensibly the livestock advertising agents of various farm and breed journals, developed into petty czars who attempted to control largely the purebred sales business. Without doubt a considerable part of the lamentable situation of that period can be justly laid to these men, but of themselves they could not have brought it about. All interests in the industry were defiled with the same pitch.

Consequently, the author's contention that the activities of these fieldmen should be limited to solicited advertising, because of the abuse they made of their other activities, does not seem justified. Assuming honesty, intelligence, and experience (and these assumptions must be made for other interests in the business if it is to be put on a sound basis) there appears to be a real place under present conditions for such men operating along the lines developed by them. And it should be an obligation of the publishers of the journals they represent to employ men of proven integrity.

Although the avowed aim of the author is the improvement of the general character of livestock through wider use of purebreds, too little discussion is given to the problems of developing this market. The methods described are largely those used in sales among breeders. For this wider distribution, other methods are perhaps needed. Some means of standardization, setting the minimum requirements for animals to be sold as purebred breeding stock, might help to remove much of the prejudice among many farmers toward purebreds, due to the too prevalent practice of selling to the ignorant scrubs with pedigrees to the ignorant.

Some apparent errors in statement are noted. On page 3 it is stated that the figures quoted giving the 1920 census record of purebreds "include both registered and unregistered purebreds". The intention of the census was to get only registered animals and the census schedule read "Report number and breed of any animals on this farm *that are registered*". On page 266, paragraph 2, it is stated that merchants' costs of doing business "including what he paid for goods, overhead and selling" . . . "rarely run above 35 per cent". Most studies of retail merchandising indicate that cost of goods sold alone runs from 65 to 80 per cent of the total sales.

Mr. Beeler's book is one that all purebred livestock producers and all persons interested in the production or sale of such livestock should read. While the practical suggestions as to advertising, salesmanship, and selling methods will be found quite useful, its great value is in the ethical standards of production and marketing it sets up as a guide to an industry just now be-

ginning to recover from a catastrophe brought on in no small degree by its failure to live up to such standards.

C. L. Harlan

Bureau of Agricultural Economics

American Charities and Social Work, Fourth Edition, by Amos G. Warner, Stuart A. Queen, and Ernest B. Harper. New York: T. Y. Crowell and Co. 1930.

Mr. Warner was the first to publish a text-book of this sort in this country in 1894 and it has gone through three previous editions. Messrs. Queen and Harper have now done a rather unique service in preserving about two-thirds of the original edition as Part II of the present volume, using it as a picture of the status of social work in the United States in the early nineties. They have prefaced this with two chapters on the history of social work and then have added Part III on Contemporary Social Work, which forms three-fifths of the book. The seventeen chapters in Part III give an excellent picture of the scope and methods of social work to-day. The book seems to be chiefly designed for use as a text for prospective social workers, rather than for the general student of public welfare problems, although it will be found exceedingly useful to social scientists as a reference book on the organization and methods of the varied activities carried on under the name of "social work". The present edition maintains the tradition of the senior author and will ensure its remaining a standard text in this field.

Dwight Sanderson

Cornell University

NEWS ITEMS

A Foreign Agricultural Service Division has been organized in the Bureau of Agricultural Economics, with Mr. Asher Hobson in charge.

This Division is to assemble information pertaining to foreign agricultural production, competition and demand, and will analyze and interpret such information in cooperation with other divisions of the Bureau. In so far as it is feasible to do so, all information collected with reference to foreign competition and demand will be used in the regular release services of the Department. Current crop and market information will be used in the regular market news service. The special foreign commodity news releases will be gradually discontinued as such, to be replaced by periodical reviews which will include statistical analyses of world-wide conditions affecting the outlook for the production and marketing of the agricultural products of the United States. The Division of Statistical and Historical Research will assume the responsibility for these periodical surveys and releases. The Foreign Agricultural Service Division will assume responsibility for continuing Foreign Crops and Markets and such additional release services as may seem necessary for the proper handling of information relative to foreign competition and demand.

The plan is to expand the service by the opening of additional foreign offices. The present offices are in London, England; Berlin, Germany; Shanghai, China; and Havre and Marseilles, France. The proposed activities of the new division call for the appointment of a number of commodity specialists. These specialists will serve as a mobile force for special assignments. They will operate in close touch with the resident foreign field force abroad and the several divisions of the Bureau. The selection of these specialists and the formulation of their projects will be made in cooperation with the divisions directly interested in the subject matter handled by the commodity specialists.

In addition to Mr. Hobson, the official force of the Foreign Agricultural Service Division in Washington includes: L. G. Michael, L. A. Wheeler, C. L. Luedtke, John L. Stewart, L. J. Schaben, Archie C. Edwards, and Miss Caroline G. Gries. The official members of the offices abroad are: Edward A. Foley, Agricultural Commissioner, and Frederick A. Motz, Foreign Fruit Market Specialist, London; Loyd V. Steere, Agricultural Commissioner, and Owen L. Dawson, Assistant Agricultural Commissioner, Berlin; Paul O. Nyhus, Agricultural Commissioner, Shanghai; William I. Holt, Senior Marketing Specialist representing the Division of Cotton Marketing, Havre; and Niels I. Nielsen, Agricultural Commissioner, Marseilles.

The International Institute of Agriculture at Rome has just recently published the 1929 edition of the International Yearbook of Agricultural Statistics. This is a volume of about 600 pages.

In the first part of the Yearbook are classified the figures for area and population in the years nearest to 1913 and 1928 for 220 countries: the

presentation of these figures throws light upon the world situation from the geographical, political and demographical points of view during both the pre-war and post-war periods. The second part is composed of a series of tables comprising for nearly 50 countries, the available data concerning the uses for which the total area is employed, the apportionment of cultivated areas between the different crops, agricultural production, numbers of the different kinds of livestock and the products derived from them. In the tables constituting the third part of the volume, have been indicated for nearly 40 agricultural products, the area, production and yield per acre in each country during the last five years of the pre-war period and during each of the years from 1925 to 1928.

For each kind of livestock, all available figures in the different countries have been grouped for the years 1913 and 1924 to 1928. A large part of the volume is devoted to statistics of the commercial movement of 42 vegetable products and 9 products of animal origin.

The part devoted to prices contains the weekly quotations of 24 agricultural products on the principal world markets for the year 1913 and for the period 1925 to June, 1929. In the freights section will be found the quotations for the carriage of wheat, maize and rice on some of the most important shipping routes, and in the section reserved for fertilizers and chemical products useful in agriculture are published statistics of production, trade and prices for 15 products. Lastly, in the rates of exchange section are set out the rates on the New York exchange for the most important currencies. The volume may be obtained at the price of 100 Italian liras at the Institute, Rome.

The Agricultural Economics Branch, Department of Agriculture, Ottawa, is conducting a study of cooperative organizations in Canada, and also undertaking an analysis of the apple industry in Canada, as well as, a study of sheep farming in western Canada. These studies are being carried on under the direction of Dr. J. F. Booth, Commissioner in the Branch, and Mr. J. Coke, Assistant Commissioner.

A Farm Economics Branch was established in the Quebec Department of Agriculture during the past year. Mr. Bois formerly of Oka Agricultural College is in charge.

At the last annual meeting of the Agricultural History Society, Dr. O. C. Stine, Secretary-Treasurer, reported an increase of 61 members during the year, making a total of 320 members.

At the University of Tennessee every Senior, in all the colleges, will hereafter be required to take a 3-hours' credit course called "Public Relations" before graduation. The object of the course is to assist each student in securing a better understanding of the economic, social, and civic conditions in the State, and his relations to them. The committee in charge of the course consists of C. E. Allred, Stanley Johnson, and T. W. Glocker.

The Canadian Society of Agricultural Economics held its annual meeting at Acadia University, Wolfville, Nova Scotia, June 25th and June 26th.

Pioneer Belt studies are under way in Western Canada. Dr. W. A. McIntosh of Queens' University, Dr. R. W. Murchie of Manitoba Agricultural College, and Dr. W. Allen, College of Agriculture, Saskatoon, are associated in supervising the work.

The first Annual Summer School for Rural Ministers will be held at Blacksburg, Virginia, from July 22nd to August 2nd for the consideration of country life problems by ministers of all denominations. This is in accordance with the plan of work decided upon by rural church leaders at the Annual Rural Church Conference on February 11th. May 25th was designated Rural Life Sunday by official proclamation of the Governor of Virginia and was recognized by the ministers of five denominations as a special day on which the complex questions of country life would be given special consideration.

The University of Tennessee and several of the other southeastern States have become interested in making an economic and social survey of the Southern Appalachian Mountains, in cooperation with Federal agencies and other interested groups. Prof. C. E. Allred and Director C. A. Mooers of the University of Tennessee have attended several preliminary conferences looking toward the organization of such a study.

Mr. Don Anderson became an instructor in Agricultural Economics, University of Minnesota, on July 1st taking the place made vacant by the resignation of Mr. G. B. Clarke.

Mr. J. Carroll Bottum, Assistant in Farm Management, at Purdue University, will take summer school work in Agricultural Economics at Cornell University.

Dean W. W. Burr of the University of Nebraska College of Agriculture and various members of the faculty cooperated in the fifth annual land valuation short course offered by the university and the bankers and real estate association of the State.

Mr. J. Coke, formerly associate professor of Agricultural Economics at Ontario Agricultural College, joined the staff of the Agricultural Economics Branch at Ottawa on April 1st, as Assistant Commissioner.

Professor I. G. Davis, head of the Agricultural Economics Department at the Connecticut Agricultural College, has resumed his duties after a year's graduate work at Harvard.

Mr. M. G. Eastman has been put in charge of a new teaching department in Agricultural Economics at the University of New Hampshire. In the past, Farm Management and Agricultural Economics subjects were taught as parts

of the courses in Agronomy. The new plan means decidedly more and better work in Farm Management and Agricultural Economics. Part of Mr. Eastman's time each year is devoted to research in economics, and this spring he is in charge of a survey party studying conditions in the wholesale market milk regions in New Hampshire.

Mr. Eric Englund has been appointed Assistant Chief of the Bureau of Agricultural Economics to succeed Mr. H. R. Tolley. As assistant chief Mr. Englund will be engaged with the administration of the research of the Bureau, and he will continue to direct the activities of the Division of Agricultural Finance of which he has been in charge since September, 1928.

Mr. Olin M. Farrington received the Master's degree in Agricultural Economics at Oklahoma A. and M. College at the end of the first semester and has taken a research position in the Department of Markets and Rural Finance, University of Kentucky.

Mr. Z. L. Galloway, on leave of absence from the Department of Farm Economics of the University of Kentucky, spent the past school year at the University of Minnesota where he received the Master's degree in agricultural economics in June.

Mr. R. M. Green, Professor of Agricultural Economics at the Kansas State Agricultural College, on leave for graduate study at the University of Chicago during the past year, resumed his duties on July 1.

Mr. H. C. Hensley, Assistant Professor of Marketing in the Agricultural Extension Service, University of Missouri, has resigned to take up work with the fruits and vegetables section of the staff of the Federal Farm Board.

Mr. F. J. Horning, formerly Chief of the Agricultural Branch, Dominion Bureau of Statistics, Ottawa, is now Assistant Commissioner to the Royal Bank, Montreal. T. W. Grindley succeeds Mr. Horning in the Bureau of Statistics.

Mr. Timothy G. Hornung, who took his Master's degree in Farm Management at the University of Illinois in the fall of 1929 after doing research work in Illinois and Nebraska, is employed temporarily in Farm Management Extension work in Indiana.

Mr. Ralph D. Jennings, of the Division of Farm Management and Costs, Bureau of Agricultural Economics, resigned April 1st to take up work with the Bureau of the Census, supervising and editing the livestock items on the farm schedules of the 1930 Census and drawing up plans for the tabulation of these data. Mr. Jennings' work with the Bureau has had particularly to do with the farm management aspects of the livestock industry.

Mr. Sherman E. Johnson has left the Montana State College of Agriculture to become head of the Department of Farm Economics at South Dakota State College.

Mr. H. H. Kauffman returned to the Poultry Department, Pennsylvania State College, upon completion of work for the Master's degree in Farm Management at Purdue University.

Mr. J. B. Kohlmeier, who has taught in the Farm Management Department at Purdue University for a number of years, has been granted a year's leave of absence which he expects to spend in graduate study at Cornell University during 1930-31.

Prof. O. G. Lloyd, Chief of the Department of Farm Management at Purdue University, who has been at Wisconsin University during the past year in graduate study, resumed his duties the first of July.

Mr. Elmer McBride, who is completing his Master's degree in the Department of Agricultural Economics this summer, has been engaged as an instructor in general agricultural economics at the Oklahoma Agricultural and Mechanical College for the ensuing year.

Mr. E. J. McConnell, fieldman on the east route for the Department of Farm Organization and Management of the University of Illinois, is now acting as assistant farm adviser in Sangamon county, Illinois.

Mr. H. J. McLaughlin, Nebraska's Secretary of Agriculture, has issued the rules necessary to the beginning of the administration of the New State warehouse law.

Mr. Elgin E. McLean is in charge of a new project recently begun at the Alabama Polytechnic Institute by the Department of Agricultural Economics to study the factors affecting the efficiency of 11 demonstration farms in Alabama. An intensive study of these farms is made possible by the unusually accurate data on all phases of the farm business. The Department is also beginning a study of farm organization in the Black Prairie belt of Alabama, in view of the distressed economic condition of the area. Much of the land has become unprofitable for cotton farming under boll weevil conditions and the project is expected to bring out the relative merits of the several enterprises which have been tried in the process of adjustment.

Mr. Albert Mighell, Research Assistant in Agricultural Economics, Iowa State College, has been granted a leave of absence and will take graduate work at the University of Minnesota.

Mr. R. M. Murphy, Assistant Extension Specialist in Farm Management, University of Tennessee, has resigned to become County Agricultural Agent of Knox County, Tennessee, with headquarters at Knoxville.

Mr. W. G. Murray, Assistant Professor of Agricultural Economics, Iowa State College, has been granted a leave of absence for graduate work at the University of Minnesota.

Mr. Peter Nelson, extension economist at the University of Oklahoma, expects to get his Doctor's degree in Economics at the University of Illinois in June, 1930.

Mr. R. D. Nichols, formerly Assistant Agricultural Statistician in the Division of Crop and Livestock Estimates, has been transferred to farm management work in the Kansas State Agricultural College and is now employed on a farm management study of the changing conditions in the new wheat region of southwestern Kansas.

Mr. Millard Peek, Professor of Agricultural Economics, Iowa State College, has been granted a six months' leave of absence to supervise the field work of the study of agricultural conditions sponsored by a group of life insurance companies. The work is directly in charge of the Metropolitan Life Insurance Company.

Mr. Clarence Pickard, formerly Associate Agricultural Economist at the Virginia Polytechnic Institute and now Director of Publicity for the South Dakota Wheat Growers' Association, has been promoted to the position of Publicity Director of the Northwest Grain Association with headquarters at Minneapolis.

Mr. H. B. Pingrey recently completed work for the Master's degree at the University of Minnesota and has resumed his position as assistant in farm organization work at the Colorado Agricultural College.

Mr. W. C. Powell, formerly Research Assistant in Agricultural Economics, University of Tennessee, has accepted a position as Assistant County Agent of Greene County, Tennessee.

Mr. Roy E. Proctor, Research Assistant in Farm Management at the University of Kentucky, was appointed as field agent in Farm Management to take the place of Mr. H. A. Ward who resigned to organize and operate a commercial farm management service in southwestern Kentucky.

Dr. Roland R. Renne is engaged in research and teaching at the Montana College of Agriculture.

Mr. George Reuss, who secured his Master's degree in the fall of 1929 at the University of Illinois, is now doing agricultural economics research work at the University of Louisiana.

Mr. Lynn Robertson, Associate in Farm Markets, Purdue University, and Mr. I. D. Mayer, of the Agricultural Engineering Department, received the Master's degree in Farm Management at Purdue University in June.

Mr. S. E. Ronk, a graduate assistant in Farm Management at Purdue University, received the Master's degree there in June and has accepted a position as assistant in the Department of Agricultural Economics and Farm Management at Cornell University.

Dr. J. T. Sanders, of the Department of Agricultural Economics, Oklahoma Agricultural and Mechanical College, will take sabbatical leave this year. Beginning July 1st he will serve on a Federal commission appointed to evaluate damages to farm lands in the Columbia River Basin in Washington resulting from the injuries caused by smelters near Trail, British Columbia. Dr. Sanders expects to spend eight months following next January in travel and study in foreign countries.

Mr. R. W. Sherman has been employed as Assistant in the Department of Rural Economics and Ohio Agricultural Experiment Station, assigned to Dairy Marketing Research.

Dr. P. H. Stephens has been designated acting head of the Department of Agricultural Economics at the Oklahoma Agricultural and Mechanical College during the absence of Dr. Sanders.

Dr. Mackenzie Stevens, Professor of Marketing and Head of the Department of Commerce, Louisiana State University, is engaged for the summer months in work for the Federal Farm Board.

Mr. Odom Stewart, formerly Research Assistant in Agricultural Economics, University of Tennessee, has accepted a position with the Tennessee Dairy Products Association, in connection with its efforts to improve marketing conditions for dairy products in Tennessee.

Prof. Charles O. Swanson, head of the department of milling industry of Kansas State Agricultural College, joined the staff of the Bureau of Agricultural Economics as consulting specialist, April 26th, to assist in a study of milling, mixing, blending, and baking practices with respect to wheats that compete with United States wheats in European markets. He will gather information on milling and blending practices and the uses to which wheats of various qualities are put in the United Kingdom, the Netherlands, Germany, France, Denmark, Belgium, and Switzerland and will also ascertain to what extent the price difference is a factor in the substitution of foreign wheat for United States wheat. Professor Swanson sailed for England early in May.

Dr. T. W. Schultz, of the University of Wisconsin, has been appointed Assistant Professor of Agricultural Economics at Iowa State College. Dr. Schultz will enter upon his duties in September.

Mr. A. C. Seymour, Research Assistant in Agricultural Economics, University of Tennessee, has been granted a fellowship at Cornell University, and will major in Rural Sociology.

Dr. F. L. Thomsen was recently promoted to the rank of Professor of Agricultural Economics at the University of Missouri.

Mr. H. R. Tolley has assumed his new duties as Professor of Agricultural Economics and Assistant Director of the Giannini Foundation for Agricultural Economics at the University of California.

Mr. C. L. Wallmark, a Research Assistant in the Division of Farm Management and Agricultural Economics, University of Minnesota, has resigned to accept a position with the Intermediate Credit Bank at Spokane, Washington. Mr. E. A. Johnson has been appointed in his place.

Mr. H. C. Woodworth after a year's graduate work at Harvard has returned to his duties as Extension Economist with the Experiment Station at the University of New Hampshire.

Mr. Hugh H. Wooton, an assistant in the Department of Agricultural Economics, North Carolina State College of Agriculture, has been appointed Associate Agricultural Economist in the Division of Land Economics, Bureau of Agricultural Economics, with headquarters at Alexandria, Louisiana. He will participate in the special land appraisal studies being made in the lower Mississippi River Valley as a part of a flood relief program planned for the region.

Mr. Leslie Wright of the Department of Farm Organization and Management of the University of Illinois has gone to the University of Kentucky where he is assisting with farm management research.

Mr. H. N. Young, now affiliated with the Department of Agricultural Economics and Farm Management, Cornell University, has accepted the position of Associate Agricultural Economist in the Department of Agricultural Economics and Rural Sociology at the Virginia Polytechnic Institute, effective September 1st. One half of his time will be devoted to teaching Farm Management and related subjects, while the remainder will be devoted to extension activities in the field of livestock and wool marketing.

"There are lots of chances for speculation in type-of-farming trend in the cotton belt due to the adaptation of power machinery, not only in preparation, but in the cultivation of cotton. At a recent group meeting in the Mississippi Delta with some of the leading plantation owners the opinion seems general that at least 50 per cent of the cotton acreage in that section may be handled with power machinery within the next few years. I understand that one concern has contracted to pick by machinery 1,000 acres of cotton this fall. With similar possibilities staring us in the face it seems that the cotton belt within the next quarter century may undergo a revolution unparalleled by anything in this section since the advent of the cotton gin some 125 years ago"—J. N. Lipscomb, Professor of Agricultural Economics, Mississippi A. & M. College.

An analysis of prices and consumption of raisins and fresh grapes is being made by the College of Agriculture of the University of California. The work was undertaken at the request of the Federal Farm Board. The study is under the immediate direction of Dr. S. W. Shear. Dr. Alonzo Taylor and Dr. Holbrook Working of the Food Research Institute at Stanford University are advising in the analysis of data and interpretation of results. Preliminary results are to be available before the movement of this year's crop begins.

NEWS NOTES

THE ENCLOSING AND PARTIAL RECLAMATION OF THE ZUYDERZEE

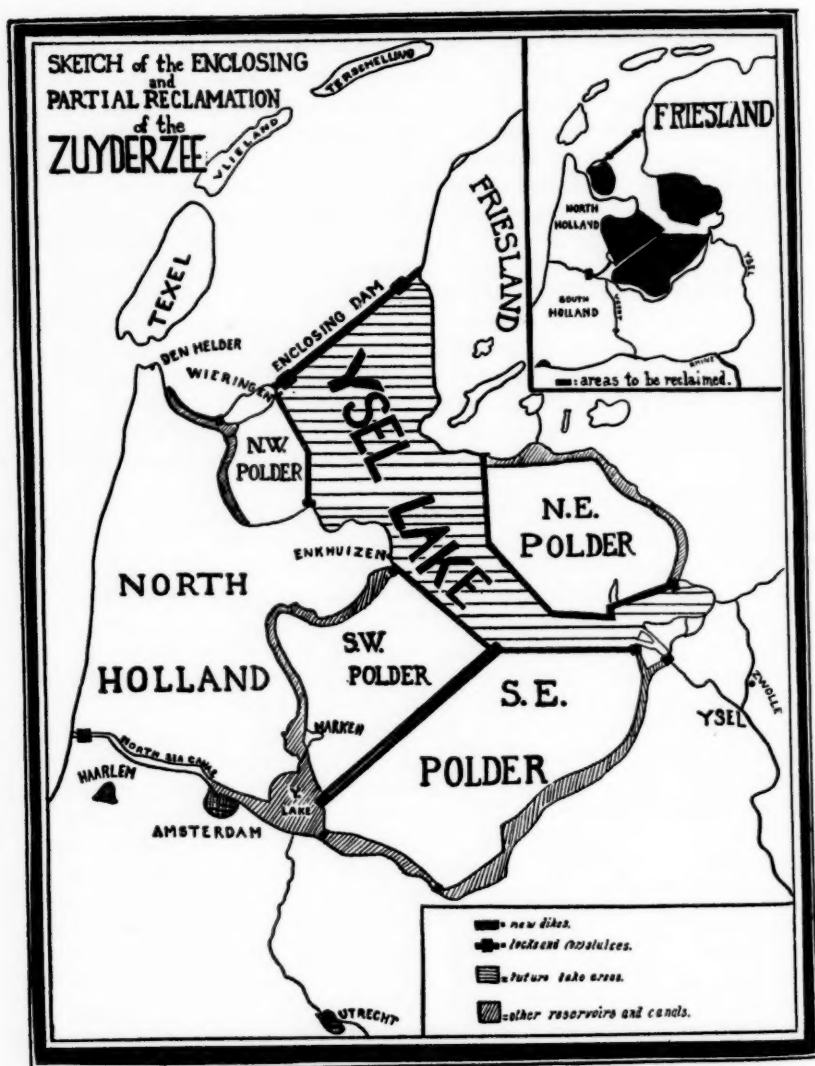
It is a well known fact that the people of the Netherlands wage a never-ending war against the sea, a war in which they have won a great part of the western half of their country. The marshy river delta land behind the row of dunes which forms the western shore line has gradually been reclaimed and transformed into a rich dairy country, and where fertile clay and deep drainage made it possible, into crop land. But at present the Dutch are engaged in a bigger fight against the sea than they have ever fought, namely, the winning back of an area which the sea has conquered and held since the close of medieval times.

For an understanding of the scale of this enterprise, some figures are needed. The total area of the Netherlands is about 7,900,000 acres—which is about three times the area of Connecticut. It is calculated that the area won from the water up to now comprises 990,000 acres; and the area of the Zuyderzee now being reclaimed will add 550,000 acres to the country, which means an increase of the total area by more than 7 per cent, and an increase of the arable land by 10 per cent.

In Roman times, this Zuyderzee territory was land except for some outlets through which the tidal streams found their way to the sea. In the course of centuries, these tidal streams eroded away the loose peat soils, so that by the fourteenth century, probably even earlier, the Zuyderzee had taken its present form, a shallow basin 3 to 13 feet deep, except in the middle, and particularly except in the tide channels which were mostly 50 feet deep.

Already in the seventeenth century there was talk of reclaiming this land; but it was not until the second half of the nineteenth that people began to think seriously about it. It is not necessary here to give an account of the several plans which were considered. The early plans did not have the reclamation of arable land so much in mind as they did the improvement of water conditions in the surrounding provinces.

To understand this latter, one must keep in mind, as mentioned above, that the greater part of Holland and Friesland consists of "polders", that is, lands below the sea level, at least below the high-water level of the sea, which are drained by pumping out the superfluous water into canals, from which in turn it is discharged into the sea, partly by pumping, partly simply by opening the discharge sluices at ebb tide. The situation in Friesland, which has no rivers of significance, is particularly difficult. In winter there is too much water and it must be discharged into the sea; but the west winds, which blow much of the time, cause the sea level to rise and make this impossible. In summer, on the contrary, evaporation reduces too far the water level in the canals and ditches, so that again the farmers have a difficult time. Water let in from the Zuyderzee is brackish, and particularly undesirable in a dairy country like this. The project now in progress will solve these difficulties, as will be shown below.



Besides this, the new conquest will protect the polders along the western side of the Zuyderzee from disasters such as occurred in 1916 when a heavy storm broke down a dike and a large area north of Amsterdam was flooded.

But another factor than these eventually came more and more into the foreground in the discussions, namely, enlarging the productive area of the country. The population had more than doubled since the sixties of the preceding century (6,865,000 in 1920), and in consequence the need for arable land had become a grave problem. The World War had shown the great disadvantage of having too limited an area available for crops. Although this reclamation would not fully solve this problem, it would help greatly to that end; and it was hoped that the returns from the enterprise would prove it to be a profitable business.

In June, 1918, a law was passed which committed the country to the execution of the plan. Since then, only changes in detail have been made. Only a part of the Zuyderzee will be reclaimed. It is necessary to reserve a big lake in the midst, to serve as a reservoir for the water discharged from the adjacent polders. The several rivers which flow into the sea in this district in the future will find their outlet in this lake. It will be a lake because the Zuyderzee will be closed by the big enclosing dam in the north, as shown in the accompanying map. Theoretically, it would be possible to reclaim the four areas shown on the map without any enclosing dam. But the needs above mentioned for water control and protection of the adjacent lands have caused the enclosing dam to be made an intrinsic part of the scheme. The lake will be a fresh water lake after a few years as a result of the great amount of inflowing fresh water. It will have a surface of more than 240,000 acres. Besides, the soil of this central area is sandy, and the depth of the water is greater, which makes this part less desirable for reclamation.

For the construction of the enclosing dam, advantage has been taken of the island of Wieringen, and also the shallowness of the sea at this point in the channel. The first part of the dam, that between North Holland and Wieringen, has a length of $1\frac{1}{2}$ miles and is already finished. The portion between the island and the coast of Friesland, with a length of about $18\frac{1}{2}$ miles, is now under construction, the work proceeding simultaneously from east and west. The thickness of the dam at the base is no less than 400 feet, the height above the average level of the sea is 24 feet, that is, 12 feet above the highest tide to be anticipated. The top of the dike is so wide that there will be room for a double railway track, and a highway. The essential part of the dike is being built of a peculiar sort of stiff loam, known as boulder clay, which is dredged from the bottom of the sea. Behind this boulder clay, sand, dredged by suction dredgers, is deposited. A stone facing of basalt protects the dike against the waves. There will be two sets of sluices for the discharge of the water and locks to permit navigation. This dam will probably be ready in 1932.

The dam will have a considerable influence on the hydrography of the sea north of the dam, for the great basin in which at present the flood currents can spread will then be closed, and the pressure on the northern dikes will be so much the greater. For this reason, these dikes are now being raised.

Another influence of the dam which will be felt even before it is finished is that on fishing. The fishermen along the coast will lose their means of living and will have to find another. The government gives as much aid as possible to these people in the form of indemnities, training for other vocations for the younger people, and in various other ways.

The land to be reclaimed will consist of four areas: (1) The Northwestern or Wieringer Polder (48,000 acres); (2) The Southwestern (140,000 acres); (3) the Southeastern (230,000 acres); and (4) the Northeastern (130,000 acres).

The Northwestern area is now diked, and the draining of this land, by means of huge pumping engines, is now in progress. It is expected that in October of this year the land will be dry. Of course this does not mean that the land will then be ready for occupancy. Some more years must pass before the salt is washed out sufficiently to permit the use of the land. Canals and roads must be laid out. The soils of this district, only 9 per cent of the total area to be reclaimed, consist of about 65 per cent light and heavy clay, 25 per cent sabulous clay, and less than 10 per cent sandy soil.

To gain experience in the solution of the agricultural problems which will arise, an experimental polder was made some years ago. A portion of the sea was dammed and drained, and under the guidance of agricultural engineers, a study was made of the way in which a maximum crop can be obtained in a minimum of time from the new soils. The experience gained so far indicates that it will be best to put them under pasture for some years until most of the salt has been washed away by the rain water.

The reclamation of the other areas will be started after the enclosing dam is finished. It is expected that the whole enterprise will be completed in 1952.

The project is carried out as a Government enterprise; but the actual operations are conducted by contractors, to whom the various parts of the work are allotted by public bidding.

It is not necessary here to give an account of the costs of the enterprise. At first it was expected that the revenues would exceed expenditures; but developments in the last year indicate costs higher than had been expected, so that it is questionable if there will be a direct financial profit. But profit is only one criterion of national advantage from such a venture. What about the future of these lands? By far the greater part of the new province will consist of extremely fertile clay soils, well suited to crops as sugar-beets, wheat, and other cereals. It is estimated that this land will have a population of about 400,000 inhabitants, partly farmers, partly people engaged in services to farmers or in agricultural industries.

In order to attain as prosperous a development as possible, it is necessary that several pertinent questions be solved before occupation. Commissions are studying some of these problems. One of the most important questions is how the government will handle the land. It will have to choose between selling or leasing it or directly exploiting it. The production will be considerably influenced by the size of the farms established and by the methods of cultivation during the first years. The questions relating to this are not yet solved. However, it seems to be the general opinion that the government

must control the new settlements during the first years at least, in some form or other, to prevent individuals from making mistakes at the start and thus checking sound development.¹

In recent years, attention has been drawn to another side of these problems. The government is being urged to adopt a regional plan, in which the solutions of several problems can be brought together into a harmonious whole. Some of the important parts of such a plan would be to determine the best sites for the towns and villages, develop a road system, and reserve areas for recreational purposes. And linked up with these and other problems should be the objective to prevent a haphazard development which would produce an unnecessary ugliness in the landscape.

An interesting point in such a regional plan will be the question of the pattern of population. Is it to be expected that this will be the same as one finds it in the old polder country, or is it likely that, under influence of modern economic conditions—for instance, the new transportation system—the population will group itself in another way? In order to find this out, it will be necessary to study the distribution of population in polders of different age and especially to ascertain the trends concerning concentration or decentralization of population in rural districts in the recent decades. Research on such problems is in its first development, and sound conclusions can be drawn only after considerable more work is done. But there seems to be an indication that the villages in the newer polders are situated at greater distances apart than is the case in the older ones.

A part of the farm population of the Netherlands lives in villages. May we expect that in the Zuyderzee polders there will be a change in this portion? The areas reclaimed in the middle of the nineteenth century and the trends in the distribution in the last decade, suggest more farmsteads in the open country than one finds now in many districts. But, as said before, an answer on these questions which will be of value for the layout of the new region, has to wait till more results of research are available. Certainly this part of the development will be an instructive subject for everyone interested in rural sociology.

J. O. M. Broek

*Social Science Research Council
New York City.*

¹ After finishing this article, the report of this matter has been published. The Royal Commission advises: (1) government exploitation during the first years; (2) later long lease; (3) an experiment with government exploitation.

CANDIDATES FOR THE DOCTOR'S DEGREE IN AGRICULTURAL ECONOMICS IN AMERICAN UNIVERSITIES AND COLLEGES, 1929-30

The name shown in parenthesis is that of the institution at which the degree is sought. The date indicates the probable time of completion. The subject of the dissertation is given so far as determined at time of reporting.

- ALBERTS, M. H.—B.A., Wisconsin, 1920; M.A., Wisconsin, 1921. (Wisconsin, 1931.)
 ALVORD, B. F.—B.S., Illinois, 1923; M.S., Illinois, 1924; "Shifts in Agricultural Production in the Red River Valley in Minnesota." (Minnesota, 1931.)
 ANDERSON, C. A.—B.A., Minnesota, 1927; M.A., Minnesota, 1928; "Social and Demographic Factors Associated with Assortative Mating." (Harvard, 1931.)
 ANDERSON, D. S.—B.S., Minnesota, 1919. (Minnesota, 1932.)
 ARMENTROUT, W. W.—B.S.A., Tennessee, 1916; M.A., Wisconsin, 1925; "Economic Aspects of County Livestock Shipping Organization." (Minnesota, 1931.)
 ARTHUR, S. W.—B.S., Iowa State, 1916; M.S., Iowa State, 1927; "Market Movement of Hogs." (Chicago, 1930.)
 ASHBURN, K. E.—A.B., Texas Christian University, 1926; A.M., Texas Christian University, 1928; "A History of the Cotton Industry in Texas." (Duke, 1931.)
 AULL, G. H.—B.S., Clemson, 1919; M.S., Virginia, 1928; "Incomes and Taxation in South Carolina." (Wisconsin, 1931.)
 BACHMANN, F.—Dr. rur. pol., Berne, Switzerland, 1927. (Harvard, —.)
 BANNERMAN, J. M.—B.Sc.A., Glasgow, 1926; "An Economic Study of 941 Automobiles on New York State Farms." (Cornell, —.)
 BAUSMAN, R.O.—B.S., Purdue, 1914; M.S., Delaware; "Some Economic Problems of Farm Organization on Tenant-operated Farms in Delaware." (Cornell, 1930.)
 BAYLA, A. M.—B.A., Philippines, 1918; M.S., Wisconsin, 1928; "Comparative Study of the Agricultural Credit System in the United States and Selected Countries." (Wisconsin, 1930.)
 BECK, P. G.—B.S., Ohio State, 1924; M.S., Ohio State, 1927; "Rural Population Movements in Ohio." (Ohio State, 1931.)
 BENEDICT, M. R.—S.B., Wisconsin, 1916; "Influence of Railway Rates upon Agriculture." (Harvard, 1930.)
 BENTON, A. H.—B.S., Ohio State, 1912; M.S., Pennsylvania State, 1913; Ph.D., Wisconsin, 1921. (Harvard, —.)
 BERG, H. A.—M.S., Illinois, 1925. (Cornell, —.)
 BOKKIN, H. H.—B.A., Wisconsin, 1922; M.A., Wisconsin, 1923. (Harvard, —.)
 BOLDYREFF, J. W.—A.B., Michigan State, 1929. (Harvard, —.)
 BOYD, H. B.—B.S.A., Saskatchewan, 1923; "Some Factors Affecting the Price for Eggs Received by Commercial Poultry Farmers in New York State." (Cornell, 1930.)
 BROOKER, M. A.—B.S.A., Florida, 1926; M.S.A., Florida, 1927; "A Study of the Cost of Transportation of Florida Citrus Fruit with Comparative Costs from Other Producing Areas." (Cornell, 1931.)
 BROWN, M. V.—A.B., Wellesley College, 1926. (Harvard, —.)
 BRUMLEY, F. W.—B.S., Florida, —; M.S., Florida, 1926.
 BUCK, J. L.—B. S., Cornell, 1914; M.S., Cornell, 1925; "Chinese Rural Economy." (Cornell, 1932.)
 BUCKMAN, R. F.—B.S., Cornell, 1914; "An Economic Study of Farm Electrification in New York State." (Cornell, 1929.)
 CADY, E. L.—B.S., Missouri, 1921; M.S., Iowa State, 1923. (Iowa State, —.)
 CAMPBELL, MISS P.—A.B., Australia, 1918; A.M., Australia, 1920; M.Sc., London School of Economics, 1923; "Rationalizing Agricultural Production." (Harvard, —.)
 CAMPBELL, R. C.—B.S., Clemson, 1921; M.S., North Carolina, 1927; "A Study of Price and Local Marketing of Cotton in North Carolina." (Cornell, —.)
 CAMPBELL, R. M.—L.L.B., New Zealand, 1923; A.M., New Zealand, 1926; Ph.D., London, 1929. (Cornell, —.)
 CANLEY, T. J.—B.A., Texas, 1926; M.A., Texas, 1926; "The Trail Driving Era." (Wisconsin, 1931.)
 CARNERROSS, J. W.—B.S., Cornell, 1925; M.S., Rutgers, 1926; "Economics of North Jersey Vegetable Acres." (Rutgers, 1931.)
 CATHERWOOD, M. P.—B.S., Illinois, 1926; M.S., Illinois, 1927; "A Production Study of the New York Milk Supply." (Cornell, 1930.)
 CHIU, A. K.—A.B., Boone, China, 1922; A.M., Harvard, 1927; "Application of American Statistical Methods to Agricultural Economic Problems to China." (Harvard, 1932.)
 CHEN, CHI TUNG—B.S., St. Johns, Shanghai, 1925; M.S., Virginia Polytechnic Institute, 1929. (Cornell, 1931.)
 CLARK, G. B.—B.S., Minnesota 1917; "Study of Minnesota System of Agricultural Taxation with Special Reference to Tax Burden." (Minnesota, 1930.)
 CLARK, O. M.—B.S., Clemson, 1909; M.S., Cornell, 1930. (Cornell, —.)
 CORNELL, F. D.—B.S., Syracuse, 1921; M.S., Cornell, 1924. (Cornell, —.)

- COX, R. W.—B.S., Illinois, 1914; M.S., Cornell, 1923; "Factors Affecting the Price of Corn." (Cornell, —.)
- DAVENPORT, R. L.—B.S., Louisiana, 1920; M.S., Louisiana, 1927. (Cornell, —.)
- DAVIS, I. G.—A.B., Bates College, 1906; "Land Utilization in Connecticut." (Harvard, 1931.)
- DE VAULT, S. H.—A.B., Missouri, 1912; A.M., North Carolina, 1916; "The Wheat Industry in Maryland." (Massachusetts Agri. College, 1931.)
- DICKEY, H.—B.A., Cornell, 1922; M.S., Iowa State, 1929. (Iowa State, —.)
- DOWELL, A.A.—B.S.A., Iowa State, 1915; M.S., Minnesota, 1925. (Minnesota, 1931.)
- DOWLER, J. F.—B.S., Ohio State, 1920; M.S., Ohio State, 1926. (Ohio State, 1932.)
- DVORACEK, D. C.—B.S., Minnesota, 1913; "Economic Factors in Land Utilization in a Typical Cut-over County." (Minnesota, 1931.)
- EASTMAN, M. G.—B.S., New Hampshire, 1913; M.S.A., Cornell, 1916; "Roadside Markets in New Hampshire." (Cornell, 1929.)
- ELLIS, L. S.—B.S., Wisconsin, 1923; "The Tariff in Relation to Sugar." (Wisconsin, 1930.)
- ERDMANN, H. H.—B.S., Wisconsin, 1929. (Wisconsin, 1932.)
- FILLEY, H. C.—B.A., Nebraska, 1903; M.A., Nebraska, 1911; "The Effects of Inflation and Deflation upon Nebraska Agriculture, 1924 to 1929." (Minnesota, 1932.)
- FREAR, D. W.—B.S.A., Minnesota, 1909; M.S., Minnesota, 1915. (Minnesota, —.)
- GANS, A. R.—B.S., Pennsylvania State, 1926; M.S., Vermont, 1927. (Cornell, 1931.)
- GEHRS, J. H.—B.S., Missouri, 1912; M.S., Wisconsin, 1915. (Minnesota, —.)
- GILBERT, C. W.—B.S., Cornell, 1916; M.S., Cornell, 1926; "An Economic Study of Tractors and Motor Trucks on New York Farms." (Cornell, 1929.)
- GRAY, W. T.—B.S., Nebraska, 1922; M.S., Wisconsin, 1928; "Measuring the Farm Family's Standard of Life by Its Spare Time Activities and Expenditures." (Wisconsin, 1930.)
- GEORGE, J. P.—B.S., Iowa State, 1918; M.S., Cornell, 1925; "Economic Study of Land Utilization with Particular Reference to Pastures in Illinois, with a Supplementary Chapter on Pastures in Europe." (Illinois, 1930.)
- GIRRBACH, G.—B.S., Minnesota, 1918; M.S., Michigan State College, 1924; "Statistical Study of Returns to Milk Producers under Price Methods as Applied in the Detroit Milk Market." (Michigan State College, 1930.)
- GREEN, R. M.—B.S., Missouri, 1914; M.S., Kansas State Agri. College, 1923; "Seasonal Fluctuation of Wheat Prices in Relation to the Wheat Production Cycle." (Chicago, 1931.)
- GRINNELL, H. C.—B.S., Cornell, 1921; M.S., Cornell, 1930. (Cornell, —.)
- HALE, R. I.—B.S., Oregon State Agri. College, 1925; M.S., Oregon State Agri. College, 1927. (Cornell, —.)
- HALL, O.—B.S.A., Arkansas, 1925; M.S., Minnesota, 1928. (Harvard, —.)
- HALLAM, A.—B.A., Wisconsin, 1914; "The Egg Industry in the United States." (Wisconsin, 1932.)
- HAMMER, C. H.—B.S., Minnesota, 1924; "The Valuation of Cut-over Land of the Lake States." (Minnesota, 1930.)
- HARPER, F. A.—B.S., Michigan State, 1926; "Financial Management and Condition of Cooperatives in New York." (Cornell, 1931.)
- HARVARD, R. H.—B.S., Florida, 1928. (Cornell, —.)
- HAUCK, C. W.—B.S., Ohio State, 1916; M.S., Ohio State, 1927; "Quality Factors Affecting Price of Fruit and Vegetables on the Columbus Market." (Ohio State, 1931.)
- HAUTER, L. H.—B.S., Purdue, 1912; M.S., Purdue, 1918; M.S., Wisconsin, 1925. (Harvard, 1932.)
- HILL, F. F.—B.S., Saskatchewan, 1923; "A Statistical Study of the Problem of Making Long-term Mortgage Loans on Farm Property in New York State." (Cornell, 1930.)
- HINTON, R. C.—B.S., London, 1925. (Cornell, —.)
- HODGES, O. B.—B.S., Alabama, 1923. (Minnesota, 1932.)
- HOFFMAN, A. C.—B.S., Kansas State Agri. College, 1926; M.S., Iowa State, 1929. (Harvard, 1932.)
- HOPKINS, E. J.—B.S., Ohio State, 1927; M.S., Ohio State, 1929; "The Effect of Weather on Crop Yields." (Ohio State, 1932.)
- HOWE, C. B.—B.S., Washington, 1922; M.A., Minnesota, 1925; "Some Local Market Price Problems Affecting the New Jersey Egg Producers." (Minnesota, 1930.)
- HUNT, R. L.—B.S., Texas A. and M., 1924; M.S., North Carolina State, 1927. (Wisconsin, 1932.)
- HUTSON, J. B.—B.S., Kentucky, 1917; M.S., Wisconsin, 1925; "The Development and Application of a Method of Research in Agricultural Economics." (Columbia, 1930.)
- JAMES, W. A.—B.S., Connecticut Agricultural College, 1929. (Harvard, —.)
- JENSEN, E.—B.S., Royal Agri. College, Copenhagen, 1916; M.S., Royal Agricultural College, Copenhagen, 1920; "Economic Organizations of Danish Agriculture." (Harvard, 1931.)
- JOHNSON, S.—B.S., Minnesota 1924; M.S., Minnesota, 1926. (Harvard, 1932.)
- JOHNSTON, P. E.—B.S., Illinois, 1917; M.S., Illinois, 1926; "Farm Profits in East Central Illinois." (Illinois, 1931.)
- KELLER, H. J.—B.S., Pennsylvania State, 1920; M.S., Wisconsin, 1921; "Comparative Advantage in Potato Production in Central New Jersey." (Harvard, 1931.)
- KING, O.—B.S., Texas Technical College, 1929. (Cornell, 1932.)

- KUHLMAN, G.W.—B.S., South Dakota State, 1925; M.S., Illinois, 1927; "Farm Income and General Property Taxes, 2,000 Farms in Oregon, 1914 to 1930." (Illinois, 1931.)
- LA MONT, T. E.—B.S., Cornell, 1927; M.S.A., Cornell, 1928; "Cost of Growing Apples, Newfane Township, Niagara County, New York, 1926, 1927, 1928." (Cornell, 1931.)
- LEWIS, A. B.—B.S., Maine, 1928. (Cornell, 1932.)
- LEWIS, G. M.—B.S., Texas A. and M., 1924; M.B.A., Harvard, 1927; "Livestock Marketing." (Chicago, 1931.)
- LIU, C. G.—B.S., Illinois, 1928; A.M., Illinois, 1929. (Cornell, —.)
- LLOYD, O. G.—B.S.A., Utah Agri. College, 1910; M.S., Wisconsin, 1912; "Administration of Groups of Farms under the Manager Plan." (Wisconsin, 1932.)
- LONGLEY, W. V.—B.S., Nova Scotia, —; M.S., Minnesota, 1912; "Economic Aspects of Local Apple Warehousing Associations in Nova Scotia." (Minnesota, 1931.)
- MALLOY, L. W.—B.S.A., British Columbia, 1927; M.S.A., British Columbia, 1929; "Surplus Control by Cooperatives." (California, 1931.)
- MARBLE, D. R.—B.S., Cornell, 1926; M.S., Cornell, 1928; "A Statistical Study of Factors Affecting Egg Weight." (Cornell, 1930.)
- MAUGHAN, J. H.—B.S., Utah Agri. College, 1916; A.M., Utah Agri. College, 1924; "Farm Tenure in Utah." (Wisconsin, 1932.)
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- POLSON, F. A.—B.S., Wisconsin, 1927; M.S., Wisconsin, 1928; "Walworth County; A Study in Social Trends and Changes." (Wisconsin, —.)
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- QUACKENBUSH, E. R.—B.S., Pennsylvania, 1921. (Minnesota, —.)
- RANNEY, W. P.—B.S., Illinois, 1917; M.S., Illinois, 1928. (Minnesota, 1931.)
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- ROBOTKA, F.—B.S., Wisconsin, 1915; M.S., Minnesota, 1921. (Chicago, —.)
- ROSS, R. C.—A.B., Monmouth, 1914; B.S., Illinois, 1923; M.S., Illinois, 1925; "Business Expenditures on Illinois Farms." (Illinois, 1931.)
- ROTH, W. J.—B.S., Colorado, 1916; B.S., Illinois, 1920; M.S., Illinois, 1922; "The Evolution of Farm Accounting in Germany." (Minnesota, 1930.)
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- SARLE, C. F.—B.S., Cornell, 1916; M.S., Drake, 1924; "Reliability and Adequacy of Crop Yield Estimates." (Columbia, 1930.)
- SATHER, A. A.—B.S., Iowa State, 1918; M.S., Iowa State, 1929. (Iowa State, —.)
- SCARBOROUGH, D. D.—B.S., Georgia, 1922; M.S., Georgia, 1923. (Cornell, —.)
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- STOKDY, E. A.—B.S., Wisconsin, 1920; M.S., Kansas State, 1924; "Some Factors Influencing the Mid-Season Potato Market." (Wisconsin, 1930.)
- STOUT, W. B.—B.S., Ohio State, 1922; M.S., Ohio State, 1928; "Direct to Packer Marketing of Hogs from Ohio." (Ohio State, 1930.)
- STOVER, H. J.—B.S., Cornell, 1926; "Relation of Daily Prices to Movement of Hogs to Market at Chicago." (Cornell, 1930.)
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- TISINGER, R.M.—B.S., Virginia Polytechnic Institute, 1922; M.S., Cornell, 1929; "An Analysis of School Transportation Costs." (Cornell, 1931.)
- TRUSSELL, B.—A.B., Texas, 1912; A.M., Texas, 1920; A.M., North Carolina, 1925. (Harvard, —.)
- ULLYOT, L. L.—B.S., South Dakota, 1927. (Minnesota, 1932.)
- UNDERWOOD, F. L.—B.S., Illinois, 1927. (Cornell, 1932.)
- UNDERWOOD, W. W.—B.S., Minnesota, 1911. (Minnesota, —.)
- VOPELUS, O.—Diploma, Landevirt, Gottingen, 1926; Ph.D., Berlin, 1929. (Cornell, 1931.)
- WARD, G. H.—B.S., Massachusetts, 1925; M.A., Minnesota, 1926; "Analysis of Price Making Forces in the New York Egg Market." (Minnesota, 1930.)
- WARREN, S. W.—B.S., Cornell, 1927; "A Farm Management Survey of Northern Livingston County, New York, for the Crop Years, 1908, 1918, 1928." (Cornell, 1930.)
- WATKINS, L. H.—B.S., Macalester, 1914; M.S., Minnesota, 1916. (Minnesota, —.)
- WEAVER, F. P.—B.S., Pennsylvania State, 1914; M.S., Cornell, 1923; "A Survey of Some Public Markets in Up-State New York." (Cornell, 1930.)
- WEBSTER, P. J.—B.S., California, 1922; M.S., Wisconsin, 1923; "The Study of Rural Education in Iowa County, Wisconsin." (California, 1930.)
- WEHRIVIN, C. F.—B.S.A., Wisconsin, 1915; M.S.A., Wisconsin, 1928; "The Agricultural Ladder in Two Regions of Widely Varying Amounts of Tenancy." (Wisconsin, 1930.)
- WHALIN, O. L.—B.S., Illinois, 1918; M.S., Illinois, 1925. (Illinois, 1931.)
- WHEATLEY, O. J.—B.S., Utah, 1929; "Effect of Receipts on the Price of Wheat on the Minneapolis Market." (Cornell, 1932.)
- WHITE, T. A.—B.S., North Carolina, 1924; M.S., North Carolina, 1929. (Cornell, —.)
- WHIPPLE, C. E.—B.S., Cornell, 1925; M.S., Cornell, 1927. (Cornell, —.)
- WILEDEN, A. F.—B.S., Wisconsin, 1924; M.S., Wisconsin, 1925; "Special Interest Groups in Rural Organization." (Wisconsin, —.)
- WITTWER, E.—B.S., Nevada, 1922; "The Allocation of Costs in Wholesale Marketing." (Cornell, 1930.)
- WOODWORTH, H. C.—B.S., Illinois, 1909; M.S., Cornell, 1916. (Harvard, —.)
- YANAGISHI, S.—B.S., Tokyo, 1923. (Cornell, 1930.)
- YOUNG, H. N.—B.S., Cornell, 1917; "Production and Marketing of Dry Field Beans in New York State." (Cornell, 1930.)

CANDIDATES FOR THE MASTER'S DEGREE IN AGRICULTURAL ECONOMICS IN AMERICAN UNIVERSITIES AND COLLEGES, 1929-30

The name shown in parenthesis is that of the institution at which the degree is sought. The date indicates the probable time of completion. The subject of the dissertation is given so far as determined at time of reporting.

- ACKERMAN, J.—B.S., Illinois, 1929; "Systems of Farm Accounts." (Illinois, 1930.)
- AYLESWORTH, P. F.—B.S.A., Purdue, 1927; "A Study of the Influence of Electrification on Farm Organization." (Purdue, 1931.)
- BARKS, C. M.—B.S., North Dakota Agri. College, 1928; "A Study of the Use of the Torren System of Land Titles." (North Dakota, 1930.)
- BARNHART, A. S.—B.S., Pennsylvania State, 1920. (Rutgers, 1932.)
- BARNHART, W. S.—B.S., Pennsylvania, 1920; "Market Outlets for Muskingum County Milk." (Ohio State, 1930.)
- BELL, W.—A.B., Kentucky, 1926. (Illinois, 1931.)

¹ At Cornell first term.

² At Harvard second term.

- BIGELOW, E.—B.A., Idaho, 1913; "An Economic Study of Feeder Sheep Partnerships." (Colorado Agri., 1930.)
- BOLENDER, E. O.—B.S., Ohio State, 1923; "Methods of Presenting Farm Management Data in Extension Reports." (Ohio State, —.)
- BOLTON, C. J.—A.B., Georgetown College, 1929; "Financing Florida Cooperative Associations." (Florida, 1931.)
- BORMUTH, W. D.—B.S.A., Purdue, 1928; "Factors Influencing the Trends of Creamery Butter Production in Iowa." (Iowa State, 1930.)
- BOVARNICK, M.—B.S., Massachusetts Agri. College, 1927; "The Transportation Problem in New England." (Massachusetts Agri. College, 1931.)
- BOWEN, O. G.—B.S., Cornell, 1916. (Rutgers, 1932.)
- BOWMAN, A. E.—B.S., Utah Agri. College, 1910; "An Economic Study of Goshen County." (Wyoming, 1930.)
- BUCHANAN, W. M.—B.S., Ohio State, 1922; "Economic Conditions of Negroes as Tenants in South Carolina." (Ohio State, 1929.)
- BUTLER, C. O.—B.S., South East State Teachers' College, Oklahoma, 1927; "Growth of Cooperative Marketing in Oklahoma." (Oklahoma A. and M., 1930.)
- BYERS, G. B.—B.S., Illinois, 1928. (Illinois, 1930.)
- CAPPER, S. D.—B.S., Kansas State Agri. College, 1921; "An Agricultural Program for Riley County, Kansas." (Kansas, 1930.)
- CARSLAW, R. M.—M.A., Cambridge, —. (Cornell, —.)
- CHANG, W.—A.B., —; Peking, 1927; (not a candidate for a degree). (Maryland, 1930.)
- CHRISTY, D. F.—B.S., Ohio State, 1924; "A Revision of the Iowa Livestock Estimates from 1860 to 1920." (Ohio State, 1930.)
- CLARK, W. N.—B.S., Wisconsin, 1915. (Wisconsin, 1930.)
- CLEAVER, H. M.—B.S.A., Oregon, 1924; "Statistical Study of Supply and Price of Onions." (Purdue, 1931.)
- COBB, C.—B.S., Kentucky, 1929; "Some Economic Aspects of the Sheep Industry in Kentucky." (Kentucky, 1930.)
- CONNELLY, R. G.—B.S., Pennsylvania State, 1925; M.S., Connecticut, 1927. (Rutgers, 1932.)
- COURTNEY, J.—B.S., Cornell, 1925; "Typical Hotel Operations." (Cornell, 1931.)
- CRANDALL, W. G.—B.S., Cornell, 1920; M.S., Clemson, —. (Cornell, —.)
- DANKERS, W. H.—B.S., Minnesota, 1929. (Minnesota, 1931.)
- DAVIS, A.—B.S., Ohio State, 1927; "A Business Analysis of the Cochocton Livestock Shipping Association." (Ohio State, —.)
- DECKER, M.—B.S., Rutgers, 1925. (Rutgers, 1932.)
- DELANY, D. C.—B.S., Cornell, 1923; "Newspaper and Magazine Interests of 374 Families, New York State, 1929." (Cornell, 1930.)
- DERRICK, W. W.—B.Sc., Texas A. and M., 1920; "Purchasing Power of Sheep and Wool." (Nebraska, 1930.)
- DORAN, E. B.—B.S., Illinois, 1906; "An Analysis of Farm Operating Costs." (Illinois, 1929.)
- DOUGHERTY, L. A.—B.S., Purdue, 1921. (Minnesota, 1930.)
- DOWNING, M. E.—B.S., Virginia Polytechnic Institute, 1928; "Forecasting the Price of Early Potatoes in Virginia." (Virginia Polytechnic Institute, 1930.)
- DROGE, W. F.—B.S., Kansas State Agri. College, 1910; "Economic Problems in Production and Marketing of Cantaloupes in the Arkansas Valley of Colorado." (Colorado State Agri. College, 1930.)
- ECKLOFF, E. C.—B.S., Minnesota, 1925; "Different Types of Price Quotations used in the South St. Paul Livestock Market." (Minnesota, 1931.)
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- EVERETT, M.—B.S., Bethel, 1908; A.B., Whitworth, 1910. (Oregon Agri. College, —.)
- FARNUM, P. E.—B.S., New Hampshire, 1925. (Cornell, —.)
- FARRINGTON, C. C.—B.S., Oklahoma A. and M., 1928; "A Study of Cotton Prices and Price Quality Relationships in Principal Markets of Louisiana." (Oklahoma A. and M., 1930.)
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- FOSTER, S. F.—B.S., Rutgers, 1912. (Rutgers, 1932.)
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- FULLER, S. F.—B.S., Iowa State, 1929; "Relations of Farm Commodity Prices to Farm Mortgages in Story County, Iowa." (Iowa State, 1930.)
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- HORNUNG, T. G.—B.S., Nebraska, 1922; "A Study of the Influence of Age of Breeding Animals on Economy of Pork Production." (Illinois, 1929.)
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- KIRKPATRICK, K. A.—B.S., Iowa State, 1909. (Minnesota, 1931.)
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- LAWRENCE, J. F.—B.A., Drury, 1901. (Nebraska, —.)
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- MADDOX, J. G.—B.S.A., Arkansas, 1927; "Cotton and Tariff." (Wisconsin, 1930.)
- MALITSKY, V. S.—; Faculty of Law. Harbin, China, 1929. (Minnesota, 1931.)
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- MARTIN, J. A.—B.S.A., Montreal, 1928; "A Farm Survey of Montreal Region." (Cornell, 1932.)
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- MILES, W. R.—B.A., Ottawa, Kansas, 1914; B.S., Kansas State, 1920; M.S., Kansas State, 1916; "The Distribution of Social and Leisure Time Activities of Family Groups in Selected Rural Communities." (Wisconsin, 1930.)
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- MOODY, R. E.—B.S., Rutgers, 1925; "Cooperatives: Do They Have the Power to Fix Prices?" (Wisconsin, 1930.)
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- NULL, L. M.—B.S., Illinois, 1929. (Illinois, 1931.)
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- PETERSON, M. J.—B.S., North Dakota Agri. College, 1929; "Comparison of the Farmers' National Grain Corporation and the Canadian Wheat Pool." (North Dakota Agri. College, 1930.)
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TABLE 1. INSTITUTIONS AT WHICH CANDIDATES FOR MASTER'S DEGREES IN AGRICULTURAL ECONOMICS AND FARM MANAGEMENT, UNITED STATES, WERE REGISTERED, 1927-1930

Institutions	1927	1928	1929	1930	Total for four years
	Number	Number	Number	Number	Number
Cornell	9	22	19	27	77
Minnesota	20	12	11	15	58
Illinois	8	11	8	22	49
Ohio State	11	9	11	11	42
Pennsylvania State	4	12	9	2	27
Wisconsin	1	11	4	10	26
Florida	5	5	10	5	25
Iowa State	—	10	7	7	24
Purdue	5	5	3	10	23
Kansas	8	4	4	4	20
Oklahoma	6	2	4	8	20
Kentucky	1	3	4	6	14
Tennessee	—	7	3	4	14
Oregon	—	4	4	5	13
Missouri	4	3	4	1	12
Rutgers	—	—	—	11	11
Texas	5	3	2	1	11
Maine	2	2	3	3	10
New Jersey	1	—	9	—	10
Wyoming	—	1	4	5	10
Nebraska	1	—	2	6	9
Virginia Polytechnic	—	3	—	6	9
North Carolina	2	2	1	3	8
North Dakota	2	2	1	3	8
Maryland	1	1	—	6	8
Colorado	—	2	—	4	6
Idaho	3	2	—	1	6
California	—	2	2	1	5
Vermont	2	1	1	1	5
Washington State	—	—	2	3	5
Chicago	—	2	2	—	4
Georgia	—	1	3	—	4
Massachusetts	—	—	—	—	—
Agricultural	—	2	—	2	4
Utah	3	1	—	—	4
Virginia	1	—	3	—	4
Harvard	—	—	3	—	3
Columbia	—	—	2	1	3
Connecticut	1	1	—	—	2
Nevada	—	—	2	—	2
Arizona	1	—	—	—	1
Arkansas	—	1	—	—	1
Delaware	1	—	—	—	1
New Hampshire	—	—	—	1	1
New Mexico	—	—	1	—	1
South Dakota	1	—	—	—	1
West Virginia	—	—	1	—	1
Total	110	150	149	196	605

Candidates for Degrees

519

TABLE 2. INSTITUTIONS AT WHICH CANDIDATES FOR DOCTOR'S DEGREES IN AGRICULTURAL ECONOMICS AND FARM MANAGEMENT, UNITED STATES, WERE REGISTERED, 1927-1930

Institutions	1927	1928	1929	1930	Total for four years
	Number	Number	Number	Number	Number
Cornell	38	34	40	57	169
Minnesota	20	20	25	25	90
Wisconsin	6	14	15	22	57
Harvard	3	7	10	22	42
Ohio State	1	5	5	6	17
Iowa State	2	3	9	3	17
Illinois	3	6	2	5	16
California	3	4	2	3	12
Chicago	—	2	3	4	9
Maryland	2	3	2	—	7
Pennsylvania State	1	2	3	—	6
Columbia	—	—	3	2	5
Michigan State	2	—	—	1	3
Missouri	—	—	1	1	2
New Jersey	—	1	1	—	2
Stanford	1	—	1	—	2
Brookings	—	1	—	1	2
Duke	—	—	—	1	1
Massachusetts	—	—	—	—	—
Agricultural	—	—	—	1	1
Northwestern	1	—	—	—	1
Rutgers	—	—	—	1	1
Washington	—	—	—	1	1
Total	83	102	122	156	463

TABLE 3. REGISTRATION OF CANDIDATES FOR ADVANCED DEGREES IN AGRICULTURAL ECONOMICS IN OTHER COUNTRIES IN 1930

Country	Institution	Number of Candidates for	
		Master's Degree	Doctor's Degree
Canada	Ontario	3	—
England and Wales	Cambridge	3	6
	University College of Wales	1	1
	Oxford	—	3
	Birmingham	—	2
Czechoslovakia	Prague	—	11
Japan	Kyoto Imperial University	15	—
	Hokkaido Imperial University	8	—
	Taihoku Imperial University	2	—
	Kyushiy Imperial University	1	—
Germany	Bonn Poppelsdorf	—	28
	Goettingen	—	21
	Hohenheim	—	14
	Rostock	—	14
	Leipzig	—	13
	Kiel	—	12
	Berlin	—	11
	Griefswald	—	10
	Halle	—	7
	Jena	—	7
	Muenchen	—	7
	Breslau	—	5
	Heildberg	—	4
	Giessen	—	2
	Marburg	—	2
	Frankfort	—	1
	Koeln	—	1
	Mannheim	—	1
	Weighenstephan	—	1
Hungary	Budapest	—	7
	Wein	—	4
Poland	Jaguellonian	—	4
	Poznan	—	3
Scotland	Edinburgh	—	1
Sweden	Lurid	—	2
Switzerland	Basel	—	3
	Brugg	—	2
Russia	Moscow	—	29
Total		83	238

TABLE 4. MINOR FIELDS OF STUDY BY COUNTRIES, 1930*

United States			
Field	Number	Field	Number
Economics	80	Agronomy	2
Farm Management	29	Business Administration	2
Agricultural Economics	20	Pomology	2
Marketing	18	Rural Engineering	2
Education	14	Biology and Botany	1
Sociology	13	Chemistry	1
Accounting	11	Extension Methods	1
Animal Husbandry	10	Finance	1
Rural Education	9	Geography	1
Statistics	8	History	1
Political Science	7	Home Economics	1
Horticulture	4	Journalism	1
Prices	4	Mathematics	1
Rural Sociology	3		
Canada			
		Education	1
Japan			
		Economics	5
		Farm Management	3
Poland			
		Business Administration	2
		Agricultural Economics	1
		Farm Management	1
		Marketing	1

* England and Wales, Czechoslovakia, Hungary, Germany, Russia, Scotland, Sweden and Switzerland did not give information.

TABLE 5. TIME ELAPSING BETWEEN COMPLETION OF UNDERGRADUATE STUDY AND THE PROBABLE COMPLETION OF ADVANCED WORK IN AGRICULTURAL ECONOMICS, UNITED STATES, 1927-1930

Number of years	Candidates for the Master's Degree				Candidates for the Doctor's degree			
	1927 Number	1928 Number	1929 Number	1930 Number	1927 Number	1928 Number	1929 Number	1930 Number
1	24	27	41	27	—	—	—	—
2	19	22	36	28	—	6	—	—
3	6	19	18	10	2	11	5	8
4	5	10	22	8	11	9	8	11
5	2	4	11	9	7	14	4	12
6	1	7	14	14	14	13	9	10
7	7	4	5	10	4	8	14	10
8	2	5	7	2	4	2	9	10
9	1	1	5	3	2	—	4	3
10	3	—	4	7	5	5	5	2
11	4	6	5	2	3	4	2	3
12	2	7	3	4	3	5	3	5
13	1	6	4	4	2	3	4	6
14	—	4	6	6	3	5	7	7
15	3	3	3	5	3	2	2	6
16	—	2	4	5	3	2	1	8
17	—	2	1	2	1	—	2	2
18	—	1	1	2	1	5	1	2
19	—	1	2	1	2	—	—	3
20	—	—	—	3	—	—	3	2
21	1	1	1	1	1	—	—	—
22	—	3	1	1	—	1	2	1
23	—	—	—	1	—	—	—	—
24	1	—	—	1	—	—	—	—
25	1	—	—	—	—	—	—	1
29	—	—	1	—	—	—	—	2
30	—	—	1	—	—	—	—	—
32	—	1	—	—	—	—	—	—

TABLE 6. FINANCIAL ASSISTANCE RECEIVED BY GRADUATE STUDENTS IN AGRICULTURAL ECONOMICS BY COUNTRIES, 1930*

	Candidates for the Master's Degree United States	Candidates for the Doctor's Degree					
		United States	England and Wales	Germany	Switzerland	Poland	Czechoslovakia
Number of students without assistance	124	72	8	157	3	3	8
Number of students with assistance	72	86	4	4	2	3	3
Per cent of students with assistance	36.7	54.4	33.3	2.5	40.0	50.0	37.5
Average income of those with assistance	\$1025	\$1301	\$975	\$336	\$576	\$312	\$500

* Canada, England, Scotland, and Wales, Japan, and Russia, Hungary and Sweden did not give information.

SUMMARY

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The rapid growth of interest in agricultural economics is reflected in the number of graduate students engaged in study in that field. In 1927, there were 193 candidates registered for advanced degrees in agricultural economics in institutions of the United States. In 1930, this number had increased to 352, or an increase of 82 per cent (table 1).

Forty-four per cent of the candidates were registered for the doctor's degree in 1930. The respective percentages in 1927, 1928, and 1929, were 43, 41, and 45. Twenty-eight institutions reported candidates for the master's degree in 1927, and 33 in each of the last three years. Thirteen reported candidates for the doctor's degree in 1927 and 1928, 15 in 1929, and 17 in 1930.

Minnesota, Cornell, and Illinois had 30 per cent of the 605 candidates registered for the master's degree during the four years. Seven institutions had over 50 per cent of the candidates registered in 1930.

Cornell, Minnesota, and Wisconsin had over two-thirds of the 463 candidates registered for the doctor's degree during the four years (table 2). Of all graduate students at these three institutions in 1930, 67 per cent were candidates for the doctorate. Of the ten institutions having the largest number of graduate students, Cornell, Minnesota, Wisconsin, and Harvard were the only ones having more candidates for the doctor's than for the master's degree.

In 1930, foreign countries reported 33 candidates for the master's degree, and 238 for the doctorate (table 3). Ten countries and 38 institutions were represented. Japan had 79 per cent of the candidates for the master's degree and Germany had 68 per cent of the candidates for the doctorate.

Economics was chosen by one-third of the 247 candidates in the United States who reported their minor field of study (table 4). Farm management, agricultural economics, and marketing were next in importance. Of the 14 foreign students reporting minor fields of study, five chose economics and three farm management.

Of the 196 candidates for the master's degree in the United States in 1930, 31 per cent received their bachelor's degree or its equivalent from either

Cornell, Illinois, Purdue, Ohio State, or Oklahoma. A total of 58 institutions in eight different countries were represented. Of the 156 candidates for the doctor's degree in the United States in 1930, 37 per cent received their bachelor's degree or its equivalent from either Cornell, Illinois, Wisconsin, Minnesota, or Ohio. A total of 67 institutions in 13 countries were represented. Of the candidates for the doctorate, 117 had received the master's degree or its equivalent. Half of the master's degrees had been received from either Wisconsin, Cornell, Illinois, or Minnesota.

The time elapsing between completion of undergraduate work and probable completion of advanced study is given in Table 5. For the master's degree the time expected to elapse ranged from 1 to 32 years. More expected to complete their work within one or two years than in any other period. For the doctor's degree the range was from 2 to 29 years. Few expected to complete their work in three years. The time expected to elapse between receiving the master's and the doctor's degree ranged from 2 to 21 years in the United States in 1930. Of the 85 students reporting, 64 per cent expected to complete their advanced work within five years after receiving the master's degree.

Over one-third of the candidates for the master's degree in the United States in 1930 received financial assistance, averaging \$1,025 (table 6). Over one-half of the candidates for the doctor's degree received financial assistance. The average amount was \$1,301.

Four out of twelve candidates for the doctor's degree in England and Wales received financial assistance averaging \$975. In Germany, only four out of 161 candidates received assistance. The average amount was \$336. In Switzerland, two out of five; in Czechoslovakia, three out of eleven; and in Poland, three out of six received financial assistance. The average amounts were \$576, \$500, and \$312, respectively.